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A Proposal

Al Hassa / Uqair

National Recreation Park

ORIGINAL

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prepared for the

Kingdom of Saudi Arabia

Ministry of Agriculture and Water

COMPLETED

A Proposal for

Al Hassa / Uqair

National Recreation Park

prepared for the

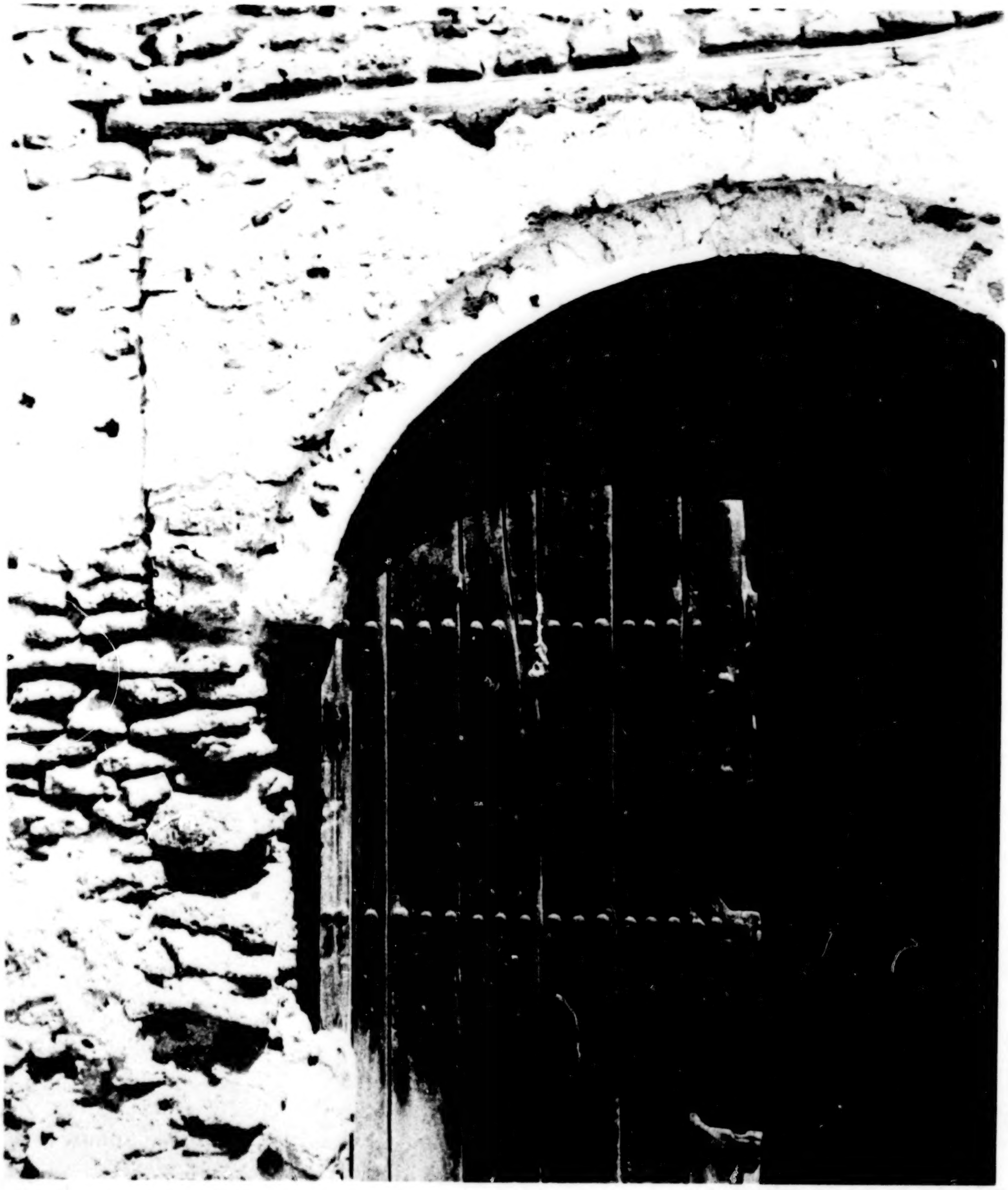
Kingdom of Saudi Arabia
MINISTRY OF AGRICULTURE and WATER

by the

U.S. National Park Service
DEPARTMENT OF THE INTERIOR

In cooperation with the

U.S./Saudi Arabia Joint Economic Commission
Riyadh, Saudi Arabia.



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Acknowledgments

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Preface

In December 1981, the Honorable Mohammed Ali Makki, Deputy Minister for Agricultural Affairs, Ministry of Agriculture and Water, Kingdom of Saudi Arabia, formally requested that a team of park specialists from the United States evaluate the recreational potential of different sites within the al Hassa region of the Kingdom's Eastern Province. Under the auspices of the U.S./Saudi Arabian Joint Commission on Economic Cooperation, representatives of the U.S. National Park Service visited the Eastern Province in March 1982 to examine the area and to determine the nature, scope, and feasibility of park and recreation development suitable to the area. Subsequently, an interdisciplinary team with expertise in architecture, engineering, interpretation, landscape architecture, and recreation planning studied the recreational, natural and cultural resources of the al Hassa oases between May and July 1982.

This report is the result of that study. It includes recreation and interpretation facility proposals, development cost estimates, and staffing needs for the proposed al Hassa/Uqair National Recreation Park. Hopefully, the plan incorporates the ideas and enthusiasm expressed by the many Saudis with whom we have worked, and that it reflects the inherent recreation potential of the area.

We extend our warmest appreciation for invaluable assistance to the many national and regional officials of the Government of the Kingdom of Saudi Arabia. In particular, we thank the regional representatives of the Ministry of Agriculture and Water, and the groups and individuals who helped us understand the role and meaning of recreation in the Eastern Province.

Plan Philosophy and Scope

This recreation development plan has been prepared to aid in meeting the burgeoning demand for recreation and leisure facilities throughout the Eastern Province and the Kingdom of Saudi Arabia. It encompasses significant natural, cultural and recreational features in the al Hassa/Uqair region, many of which are well known throughout the Kingdom and currently are being used for various forms of recreation. It has been prepared to serve as a guide for decisionmaking and budget allocation and as the basis for more specific site design and development studies.

The al Hassa/Uqair region of the Eastern Province possesses sites of outstanding recreation potential. This potential is illustrated by a scenic beauty that combines and contrasts the oases and the desert, by a wealth of historic sites, and by the high levels of use at presently developed sites. Establishment and development of al Hassa/Uqair National Recreational Park would provide outstanding recreation opportunities, would broaden and strengthen consciousness of the environmental and historical values of the region that are special to the people of Saudi Arabia, and would demonstrate the tangible economic benefits of recreation development. Al Hassa/Uqair National Recreation Park, with its diversity and scale of recreational opportunities, cooperative management, private sector involvement, and wide variety of natural and cultural features, can be a model for park development throughout the Arabian Peninsula.

The plan for the al Hassa/Uqair National Recreation Park recommends development of a number of sites and features identified through field reconnaisance and recommendations. The maps for the project area and individual sites are based on data from existing maps and/or rudimentary field surveys completed by the planning team. Before more detailed plan-

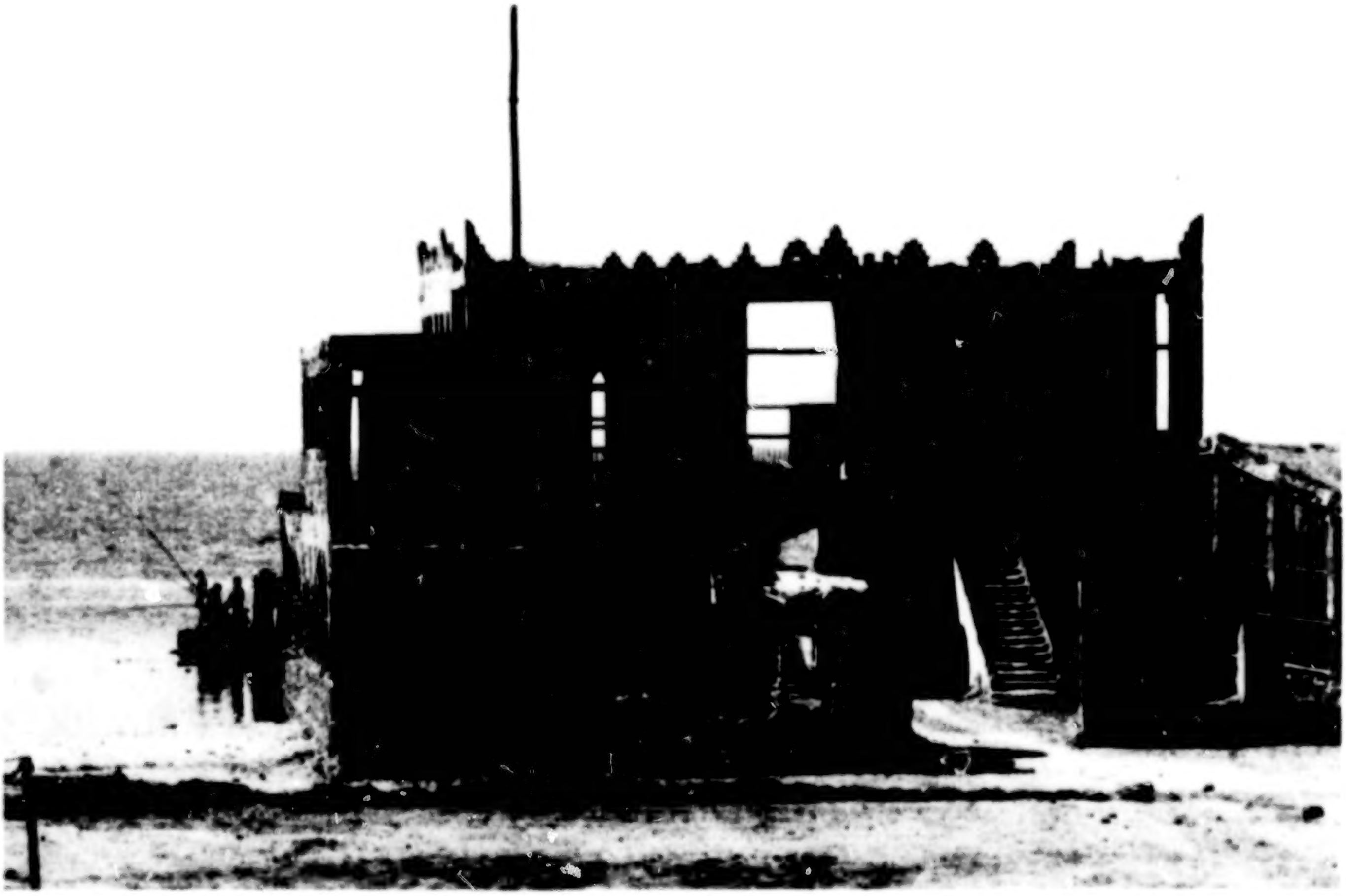
ning is undertaken, site specific topographical data will be required.

The proposed park developments are the products of information and recommendations received from Saudi officials and private citizens, coupled with the professional judgment of the interdisciplinary planning team members. Some of the recreation facilities and activities proposed in the plan are relatively new and "untested" in the Kingdom, and their use should be carefully monitored. Analysis of resulting use patterns and preferences will suggest design modifications that will be helpful in planning future facilities both within the study area and in other parts of the Kingdom.

The oases of al Hassa already attract visitors from many parts of the Kingdom and beyond. People use the beaches and warm waters of Uqair. A few are aware of the historical resources and come to al Hassa to explore part of their nation's past. Some have discovered the expanses of water and sand of the evaporation seas. All of these resources have potential that far exceed present use. The quality and variety of the resources and their potential for development make possible a park not only for the residents of al Hassa, but also for all residents of the Kingdom. The proposed park would consist of geographically distinct sites administered by different agencies. Unified national park administration, visitor and resource protection, interpretation, and maintenance at the various sites would facilitate efficient use of manpower and funds and, just as importantly, would build visitor expectations concerning the kinds and quality of services to be provided at the sites. As these expectations are met, a broad base of public support for the park and its policies would become established. A close working relationship between the individuals and groups who will be involved in subsequent planning, design, and management of the park will be essential.

The park would combine geographically distinct sites administered by different agencies into an integrated and functional park unit. Private enterprise, through concession operations at various sites and anticipated hotel and resort development at Uqair, would play a vital role.

Preliminary to preparing the plans and recommendations, but after field investigations and discussions with Saudi officials and private citizens, the following statement of goal and objectives was prepared to guide the study effort.



Statement of Goal and Objectives

Project goal: To develop conceptual plans, sketches, priorities and cost estimates for recreational development and interpretation of the natural, cultural and historical resources of the al Hassa region for the use and enjoyment of the people of Saudi Arabia.

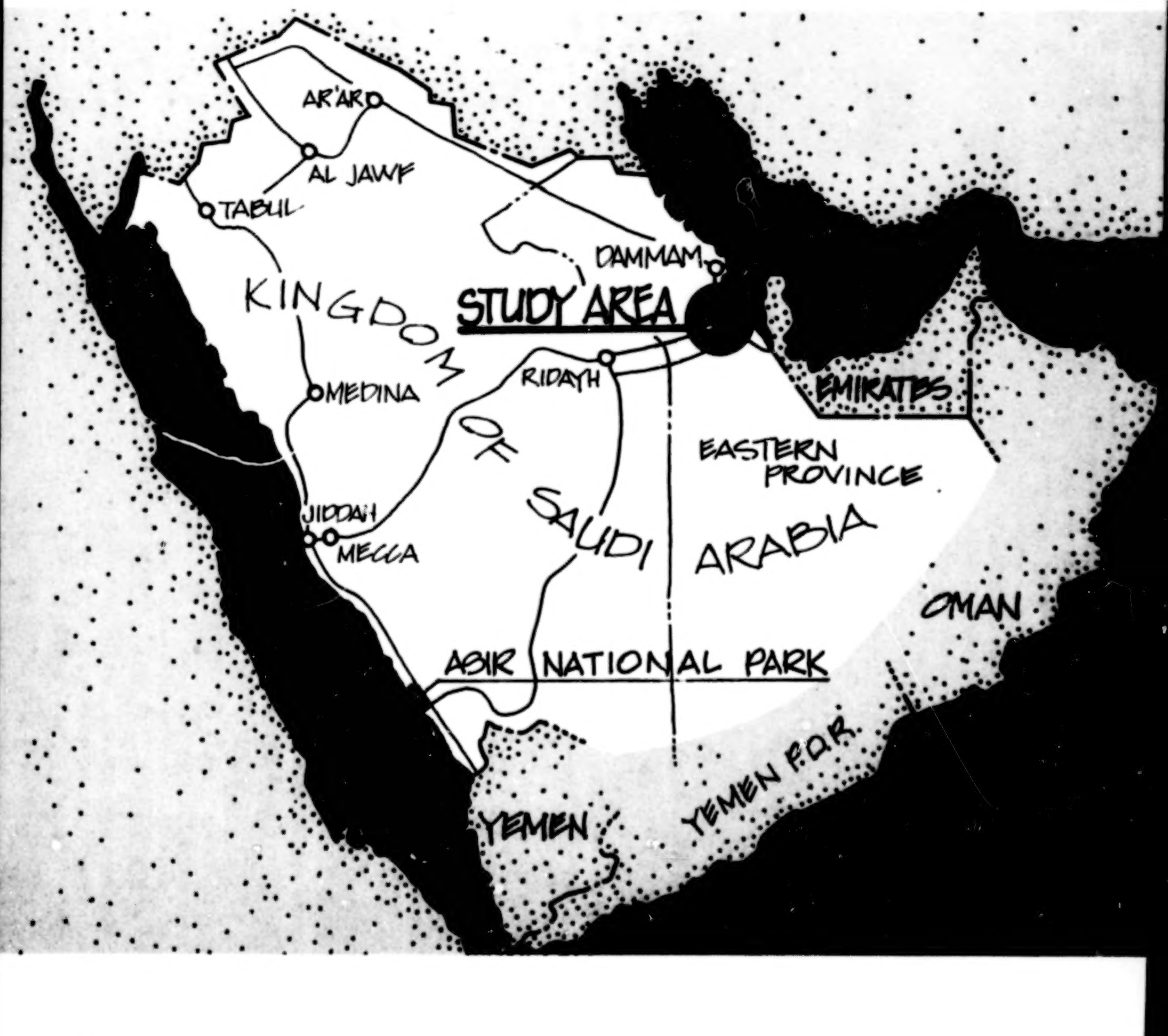
Specific objectives:

- to examine the various recreational, natural, cultural and site modification features of the region;
- to assess the recreational needs of the resident population and of visitors to the region;
- to identify specific sites for recreational development;
- to set forth development cost estimates for each of the recommended sites;
- to involve continuously and to the fullest extent possible national, regional, and local government officials, and interested organizations and individuals in the planning process;
- to minimize development costs through the fullest possible use of public lands and existing site modification projects in the region; and,
- to recommend a comprehensive program to provide information/orientation services and interpretation of site resources and values for park visitors.

Study Area Description

The al Hassa oases are the largest in Saudi Arabia and possibly the largest area of spring-fed oases in the world. This area has been inhabited for well over 4,000 years. The oases mark the western edge of the coastal desert and make intensive agriculture possible. Hofuf was once the capital of the Eastern Province and a camel caravan trading center for ports on the Arabian Gulf.

The oases of al Hassa extend from approximately 25 degrees, 21 minutes to 25 degrees, 37 minutes North latitude, and 49 degrees, 33 minutes to 49 degrees, 46 minutes East longitude. The oases are in an "L" shape with Hofuf at the southwest corner, Mutaragah to the north and Jishshah to the east. Artesian springs provide water for domestic, agricultural, industrial, and limited recreational use. Al Hassa, meaning "swampy area covered by sand," is home to an estimated 500,000 people residing in three cities (Hofuf, Mubarraz, and Uyun) and over 60 satellite villages. The study area also includes the port, village and beaches of

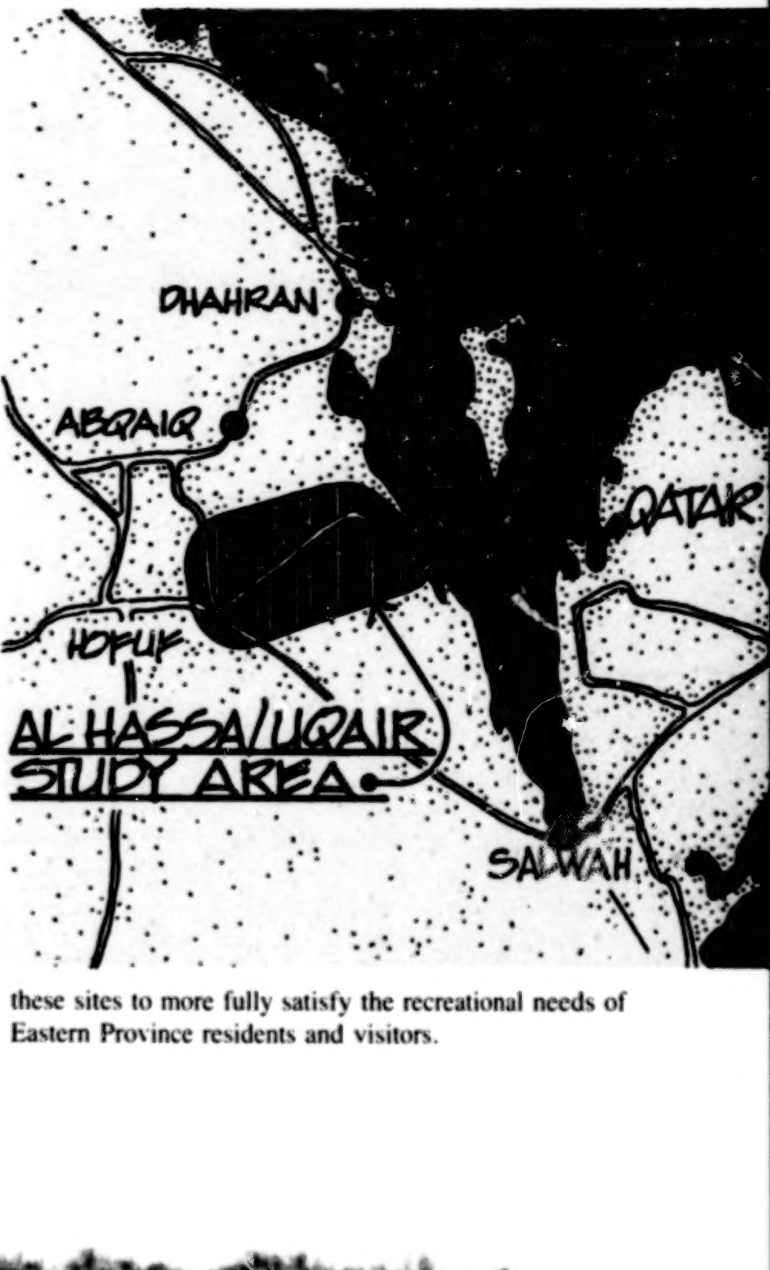


Uqair, 70 kilometers east of Hofuf on the Arabian Gulf. Lands between Hofuf and the Gulf are arid and generally uninhabited. The study area encompasses approximately 4,000 square kilometers.

Hofuf is 328 kilometers east of Riyadh, 154 kilometers south of Dhahran, 591 kilometers southeast of Kuwait, and 200 kilometers north of central Qatar. Highway access from these areas is good and will improve with the completion of several highway projects. The railroad line between Riyadh and Dammam, with stops in Hofuf and other cities along the route, is being upgraded. There are plans for a new airport to serve the Hofuf area. These improvements will make the proposed park even more accessible to visitors from Riyadh, Dhahran, Dammam, Kuwait and Qatar.

Modern architecture and vehicles contrast sharply with the sights and sounds of old Arabia in the cities and villages of al Hassa. The Suq al Khamis (Thursday market) in Hofuf is an important retail center and visitor attraction where traditional Arabian wares are sold next to modern products. The caves of Jebel al Q'arah house potters who produce earthenware jugs and pots by traditional methods for sale to residents and tourists. Roads connecting the oases pass through many small villages and farms where manual labor is still common. Camels, cattle, sheep, goats, and donkeys can be purchased at the Thursday market and donkeys pulling small carts are common sights along highways.

Limited recreational and leisure facilities are now available in the cities and villages, public school playgrounds and fields, Mashatal al Shapane Park, the caves of Jebel al Q'arah, Jawatha Mosque, the Sand Stabilization Project, two extensive evaporation seas, and the beaches at Uqair. This plan proposes new and expanded development at many of these sites to more fully satisfy the recreational needs of Eastern Province residents and visitors.



Climate

The climate in the Eastern Province ranges from extreme summer heat to moderate winter temperatures with occasional frost. There are periods of concentrated rain, strong winds and sandstorms. On the average, the Eastern Province receives 60mm (2.3 inches) of precipitation per year. In summer, afternoon temperatures may reach highs of 52 degrees C (125 degrees F). The average relative humidity is moderate (39%) and increases slightly as one moves toward the Arabian Gulf. Evaporation rates are high. Winds generally are strongest during June and July, with occasional shamals (sandstorms) with winds of 40-50 km/hr (25-30 mph) and gusts of 100 km/hr (60 mph). August is the hottest month but usually the calmest.

October and November are transitional months as temperatures moderate and the relative humidity begins to rise. December through February is characterized by periods of variable winds, some rain, thunderstorms, and blowing sand with relative humidities in the 50-60% range. Freezing temperatures have been recorded in December and January. The winter storms diminish during March and April, although intense thunderstorms may occur. Temperatures rise and humidity decreases as summer approaches.

From June through September the al Hassa area is hot, but outdoor recreation activities in the cooler morning and evening periods can be pleasant experiences. December through February are cool but generally sunny and are ideal for outdoor recreation. The spring and fall provide many weeks of cool, pleasant weather and are extremely pleasant periods for active, outdoor recreation activities.

Geology

The project area is part of a geological zone which extends from the Kuwaiti border in the north to Haradh in the south, the Arabian Gulf in the east to the Dahara Desert in the west. The strata dip gently from west to east, interrupted along the Arabian Gulf by a series of folds oriented in a north-south direction. The al Hassa oases are 130 to 160 meters above sea level. To the west, the steep scarp of the Shedgum Plateau reaches an altitude of 290 meters.

Between 40 and 60 million years ago the area was covered by a sea. Layers of marine limestone, sandstone, and shale were deposited on the sea floor. The surface layer, ranging in thickness from 0.5 meters to 2.0 meters consists of fine loamy sand and loam, beneath which is a nearly impermeable layer of sandy clay marl. In the last two million years the chief agents shaping the topography have been the erosional activity of the wind and infrequent rain, the transport of material by the wind, and the subsequent accumulation of material. Large sand dunes moving slowly southward

have historically posed a major threat to the villages around the oases, but sand stabilization programs have effectively stopped this encroachment.

The prominent geological features are sand dunes, the Arabian Gulf coast, and the springs of the oases. A number of jebels carved from the marl and sandstone, and sabkhahs, consisting of slit, clay and salt flats, also are common features.

Hydrology

Al Hassa is the largest oases area in the Kingdom of Saudi Arabia and possibly the largest in the world. Covering an area of 180 square kilometers, the oases derive their water from artesian springs and wells. The springs and surface run-off from the coastal sabkhahs are the only natural flows of surface water in the area. The artesian springs of al Hassa are fed by rainwater trapped in the Tuwaiq Escarpment catchment basin near Riyadh. The water seeps into the eastward dipping strata to form aquifers at three levels underground—the Wasia (lowest) the Umm er Radhuma, and the Neogene. There is sufficient water volume within the aquifers to provide strong flowing springs and wells year round. It is estimated that the water takes 15,000 years to flow the length of the aquifer.

There has been a slow but continuous fall in the water level of the Neogene aquifer, probably the result of increased well drilling in recent years and the ever increasing demand for and use of water in the al Hassa area. However, the lower aquifers are still largely untapped and it is estimated that the water should last for at least another 100 years.

Flora and Fauna

Saudi Arabia lies in a transition zone between three major biogeographical areas: the Ethiopian or African; the Palaearctic (which includes Europe and northern Asia); and the Oriental or Indian region. Each has distinctive flora and fauna, and the influence of each is felt in varying degrees throughout Saudi Arabia. The flora and fauna of al Hassa are principally Palaeartic.

Because of the availability of fresh water at various sites throughout the region, the Arabian Gulf region, and more specifically al Hassa, has a wider variation of plant and animal species than many deserts. However, it is still unclear how many species of mammals, birds, reptiles, and fish are common to the area. Much less is known about their range, habitat requirements and species viability.

The flora of the area include desert species that have adapted by: compressing their life cycles to take advantage of short, favorable growing periods; structural adaptations to reduce water loss; and/or being able to take advantage of the abundant water supply.

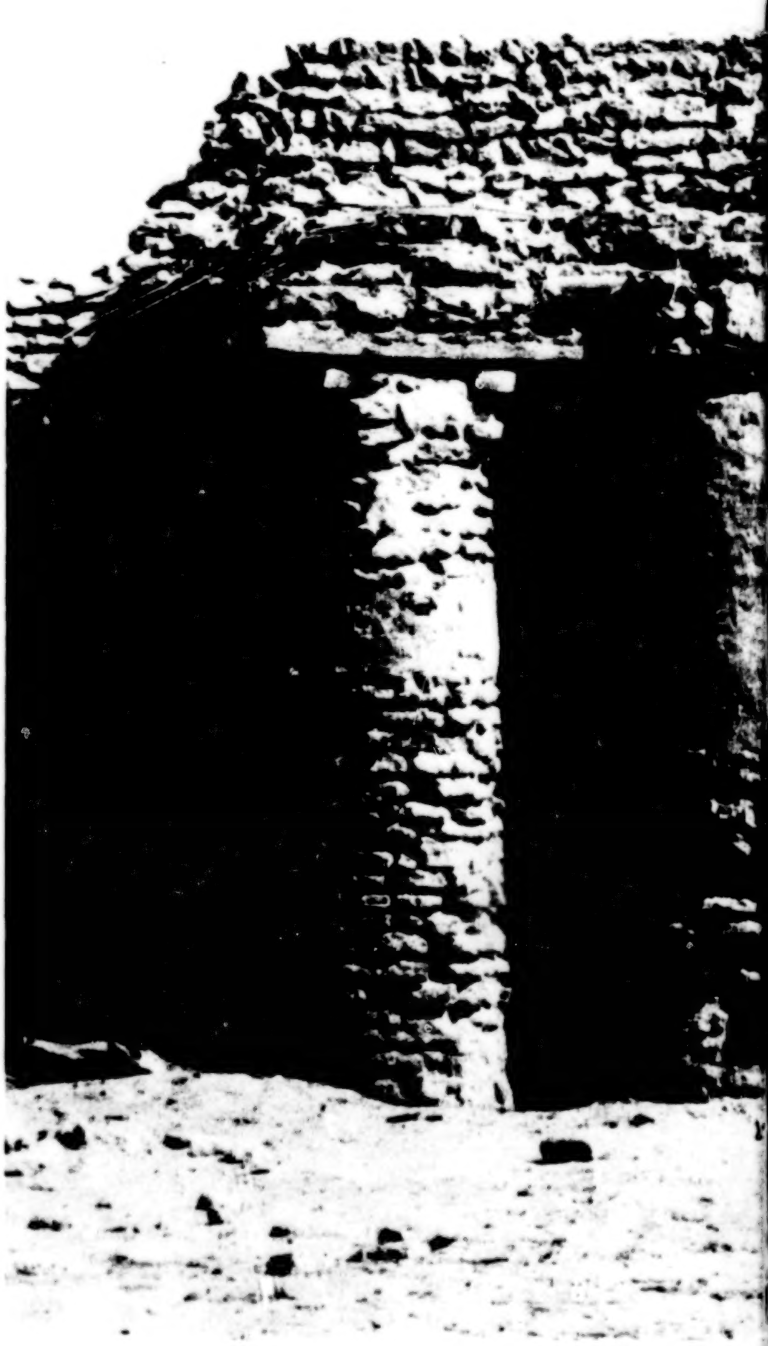
The flora and fauna in the Gulf have adapted to a number of environmental constraints, i.e., the shallow waters are subject to above average temperature fluctuations, the Gulf's evaporation rate exceeds freshwater input, thereby creating high salinity, and the narrow Strait of Hormaz limits the exchange of waters with the Indian Ocean. Like the desert flora and fauna, there are a remarkable number of plants and animals in the Gulf's waters that have adapted to environmental extremes. Most of the organisms are benthic, or bottom dwelling, but there also are sea turtles, sharks and large fishes such as barracuda and mackeral. The reef areas, usually found several kilometers offshore, are marine "oases" rich in flora and fauna.

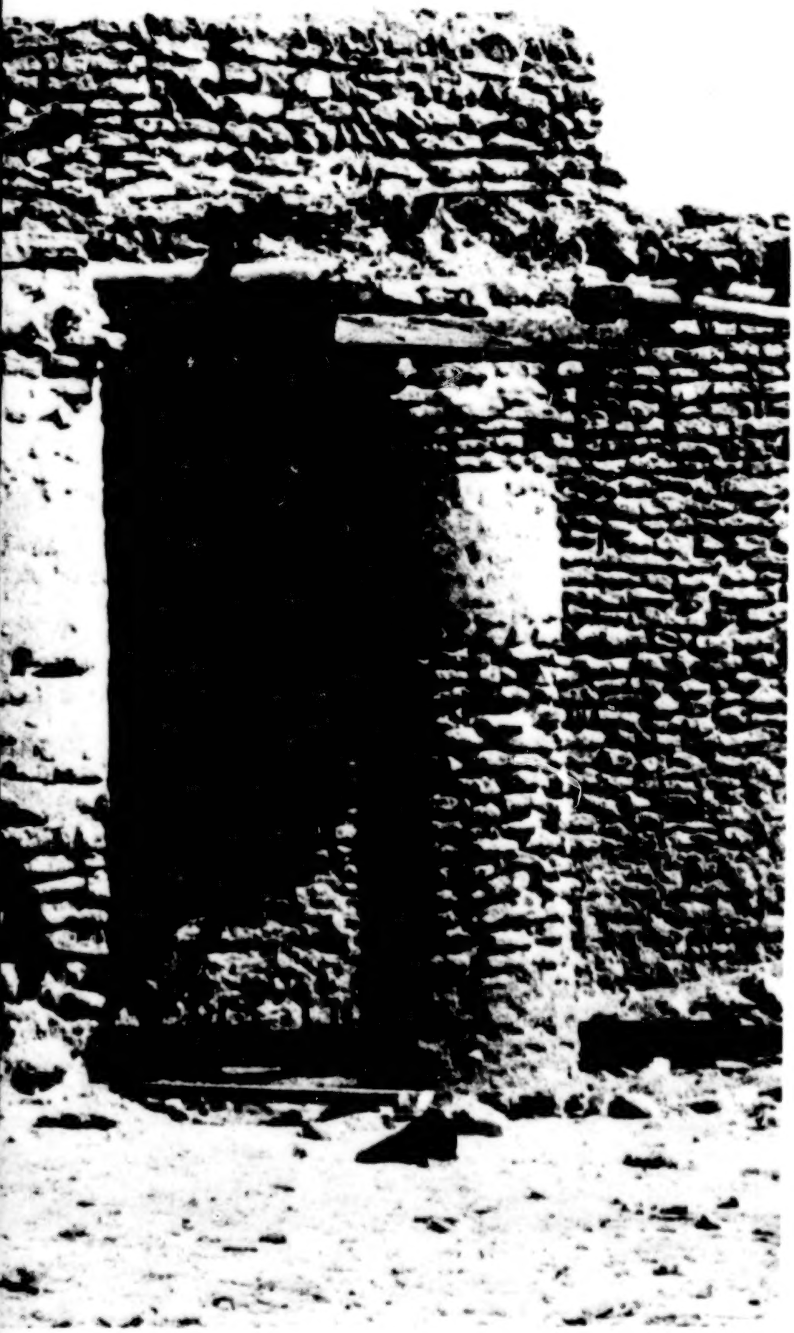
Over 50 species of mammals including camels, antelopes and foxes, as well as smaller species such as bats and highly specialized rodents, are present in the Gulf region. The bird life, especially in al Hassa, is even richer. Over 80 species are common in the area. Members of the planning team saw a wide variety of birds including bitterns, herons, grebes, coots, palm doves, desert larks, bulbuls, and owls.

The study of the birds is especially challenging because the area is situated along the migration route between Eurasia and Africa. A tremendous diversity of species and large numbers, perhaps three billion, migrate over the area annually, often breaking out of strictly defined routes and seasons. This results in an airborne flood of birds for several months with significant numbers of stragglers being attracted to and wandering through the area at any given time. Over a year one could expect to see approximately 300 different species.

Man's impact on the flora and fauna in the project area, much as man's impact in the rest of the world, has been largely negative. The Bedouin's reduction of predators, the overgrazing of the desert, the exploration for oil in the Gulf region, and urbanization all have left their significant mark on the environment. The project area has experienced significant long term habitat loss and the resultant extinction of a number of species. In the Gulf region, many predator species, as well as the ostrich, Hubar bustard, Arabian oryx and the gazelle have disappeared; it appears the wolf, desert hare, and desert partridge may soon follow suit.

However, in al Hassa, with its abundance of water, man has created a number of new habitat areas: the evaporation seas, sewage lagoons, irrigated crops, gardens, and refuse areas. Airports have become prime areas for climax natural vegetation and associated fauna because the fencing keeps out camels, sheep and goats. The development of the irrigation systems and evaporation seas have added excellent new wildlife habitat. The evaporation seas are perhaps the most indicative of the tremendous impacts man has had on the





area. They may be the finest bird habitat in the Gulf region and support significant amphibian and fish populations as well.

Archeology and History:

The abundant, high quality artesian water has made the al Hassa oases a focal point of human history in the eastern Arabian Peninsula. Evidence of human occupation in the Eastern Province dates back to Pleistocene times (more than 10,000 years BP). Evidence of at least partially settled communities dates to roughly 9000 B.P. Extensive contact with contemporary cultures, most notably the Ubayd civilization of Mesopotamia, is indicated by archeological remains of 7000-5000 B.P. as al Hassa provided agricultural products for Mesopotamia, India and Africa, principally through the port of Uqair. During the period 4000-3000 B.P., the population centers in eastern Arabia declined as people dispersed throughout the region. Three thousand to 2000 B.P. was again a period of vigorous trade and a return to population centers. Regular caravan traffic moved between the Arabian Gulf port at Uqair and al Hassa. The growing prosperity of the region and its strategic location along the Arabian Gulf trade routes led to continuing conflict for control of access and resources.

The Islamic period began in 622 A.D. when the Prophet Mohammed enunciated the fundamental tenets of the Islamic religion. Islam exerted a unifying influence on the divergent tribes of the Arabian Peninsula. Jawatha, within al Hassa, was built in approximately 635 A.D. and is believed to be the second oldest mosque in Arabia. It has special significance to the people of al Hassa and to followers of Mohammed throughout the world.

The early Islamic period (A.D. 630-1055) witnessed the rise of the Qarmathian state within the oases, with substantial population centers developed and bound together by complex irrigation and drainage systems. The downfall of the Qarmathians came early in the middle Islamic period (A.D. 1055-1500) as the population splintered into isolated settlements around individual springs and wells. Inter-tribal and family conflicts occurred and the reliance on the central irrigation system was reduced.

By the late Islamic period (A.D. 1500-1750), development in the oases was significant enough to attract the attention of a strong and aggressive neighbor leading to conquest by the Ottoman Turks. During their occupation, the Turks developed a network of forts and watchtowers to defend major access routes to the oases (Uqair-Jishshah-Hofuf) and the major population centers at Hofuf and Mubarraz. Also beginning in the 16th century, increasingly sophisticated agricultural techniques and new trade patterns evolved. The Recent Era (A.D. 1750 to Present) has witnessed a rebirth of a unified population centered in the oases. The expulsion of the Turks from the oases in 1913 by Abdul Aziz Ibn Saud brought al Hassa within the sphere of the future Kingdom of Saudi Arabia.

To help identify, protect and preserve the Kingdom's antiquities, the Department of Antiquities and Museums was established in the early 1960s as part of the Ministry of Education. The Department of Antiquities and Museums now has an active program of archeological survey, research, building conservation, interpretation, and museums throughout the Kingdom.

Site Modification

Al Hassa is a major agricultural district and the largest block of irrigated land in the Kingdom. For centuries it has been the primary agricultural area in the eastern part of the Arabian Peninsula. Dates, alfalfa, rice, and vegetables are major crops, with dates the most important.

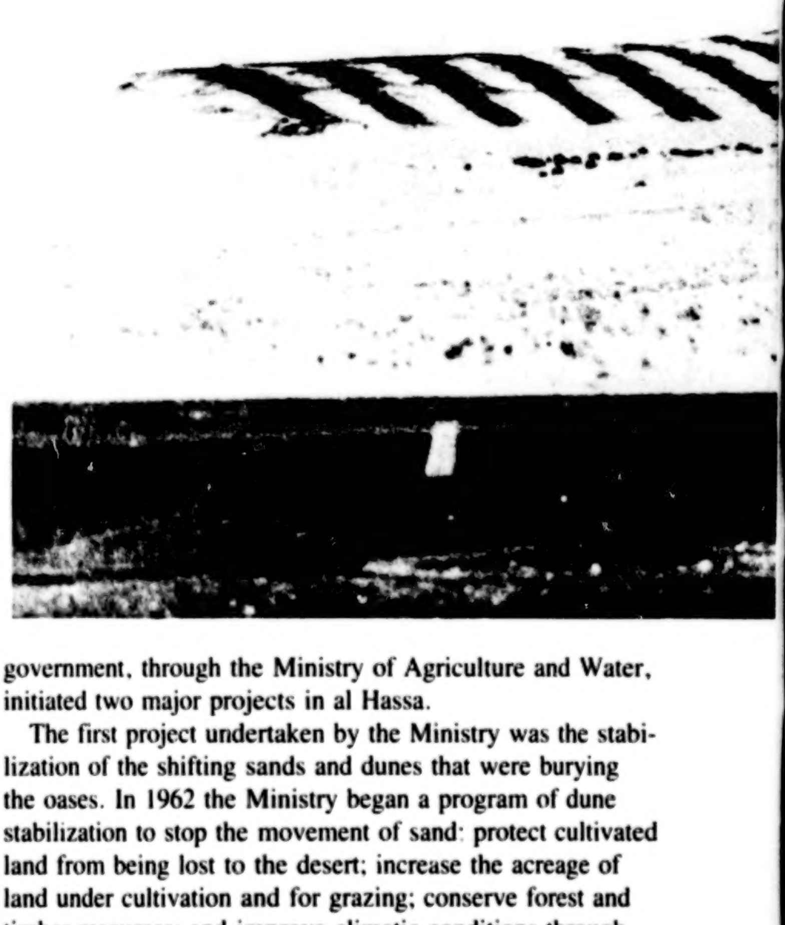
Water rights issues have had a long history in Saudi Arabia. Farms closest to the springs had the use of the freshest and most abundant water, while farms further from the springs received the run-off. As the water passed from one field to another, it became more saline and less usable. Spring water flowed continuously and surplus water drained to sabkahs and disappeared in the sands. In other places the land became water-logged.

The oases are assumed to have extended northeast of Jawatha Mosque in the Middle Ages. However, shifting sand and soil deterioration caused them to diminish in size. The northeastern quadrant of the oases has been exposed continually to the prevailing northern winds. The shifting dunes buried villages, destroyed cultivated lands, and blocked irrigation canals, creating water shortages. High wings caused extensive crop damage. Shifting dunes forced people to move south, abandoning villages and farms and establishing new ones.

In the early 1960s the Saudi Arabian government evaluated the situation and found:

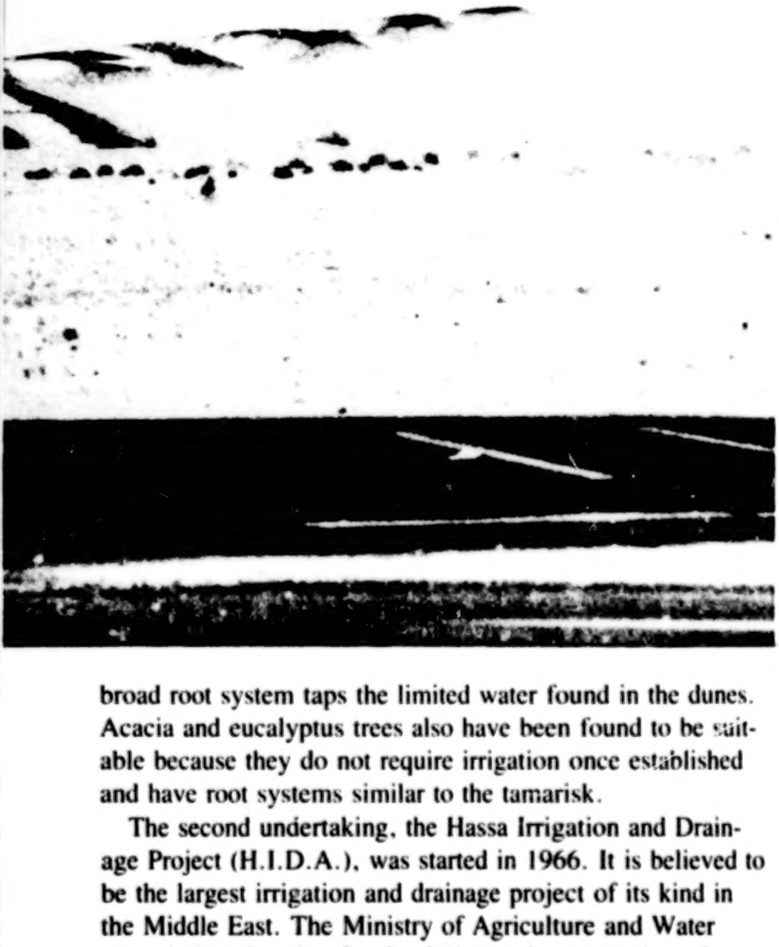
1. Much of the water was lost through evaporation and water-logging.
2. Agricultural land was suffering from salinity which reduced its productivity.
3. The amount of land which could be developed exceeded the irrigated area.
4. 25-30% of the available water was needed to leach the saline soil and improve its productivity, thus a complete drainage system was required.
5. Movement of the 2-12 meter high dunes over an estimated area of some 35km by 9km threatened the oases.

To protect the agricultural resource, the Saudi Arabian government, through the Ministry of Agriculture and Water, initiated two major projects in al Hassa.



The first project undertaken by the Ministry was the stabilization of the shifting sands and dunes that were burying the oases. In 1962 the Ministry began a program of dune stabilization to stop the movement of sand: protect cultivated land from being lost to the desert; increase the acreage of land under cultivation and for grazing; conserve forest and timber resources; and improve climatic conditions through all possible conservation practices.

To accomplish this, the Ministry used a variety of methods. Early attempts consisted of spraying the sand with asphalt, spraying the tops of the dunes with crude oil, covering the dunes and sand with concrete slabs, fixing the dunes with rubble, cement and crude oil, and ditching. These all proved to be very expensive and, to be effective, had to be repeated every three to five years. Agricultural efforts seemed to be the most effective. However, the planting of grasses within fenced areas was also very expensive. The most successful method has proven to be afforestation. Tamarisk trees were found to be the most suitable as their



broad root system taps the limited water found in the dunes. Acacia and eucalyptus trees also have been found to be suitable because they do not require irrigation once established and have root systems similar to the tamarisk.

The second undertaking, the Hassa Irrigation and Drainage Project (H.I.D.A.), was started in 1966. It is believed to be the largest irrigation and drainage project of its kind in the Middle East. The Ministry of Agriculture and Water commissioned a plan for the design and construction of a system that would provide fresh water to all parts of the oases and remove the saline water from the agricultural areas, thus restoring the fertility of the soil. The existing system consists of pumping stations, irrigation and drainage canals and ditches of varying sizes, two evaporation areas, an extensive road system and support facilities throughout the oases.

Approximately 3000 km of canals lace the landscape, irrigating and draining the fields throughout the oases. The system has two major parts, one extending into the northern oases, the other into the eastern oases. The system moves irrigation water from the springs and man-made reservoirs to all areas of the oases. The water drains into a series of ditches and canals which carry it to evaporation seas to the north and northeast of the oases.

The results have been a more even distribution of fresh water to all parts of the oases, restoration of the soil, and increased productivity. Fresh water is no longer lost to sabkahs and depressions in the landscape, nor are lands waterlogged because the system holds water in the canals and reservoirs until it is needed by farmers.

Recommendations for Park Development

The team considered a number of important factors in determining the types and density of recreation development proposed for the various sites. They include:

- access, both existing and proposed;
- location relative to population centers;
- inherent recreation potential, reflected by the size, quality, and extent of natural, historic, and cultural features;
- existing recreation development and intensity and character of use within the site;
- the scale (cost) of proposed park development and related construction and stabilization, and the architectural and engineering complexities associated with facility design;
- the role of the site (e.g., recreation, historic, natural) in the overall plan and how well it complements other sites.

An important additional consideration is the need to develop a core number of sites that together constitute a threshold for effective park administration and for public recognition as a national recreation park.

Based on these considerations, the study team recommends that the following sites and facilities be considered for development in the initial phase of park development.

- Mashatal al Shapane Park;
- Jawatha Mosque;
- Sand Stabilization (including park headquarters, visitor center, and maintenance facilities);
- North Evaporation Sea (including visitor center);
- Uqair Fort and Beach;
- Q'asr Kilabiyah;
- Jebel al Q'arah;
- Al Hassa Hiking/Biking Trail.

Taken together, this complex of sites offers visitors a diverse range of recreational, natural, historic, and inspirational experiences; comprises a unit of sufficient scope and size to be effectively managed as a national recreational park; and would be recognized throughout the Kingdom as an important recreation resource.

The total estimated cost for development of the sites is 71,480,000 SR, and they comprise an area of roughly 30,750 hectares.

Other proposed sites that complement this core group area and which may be considered for subsequent development as funds permit and/or future use patterns indicate include:

- Jebel Arba;
- Q'asr Waziyah;
- Q'asr Ibrahim;
- South Evaporation Sea;
- Historic Cavaran Route.

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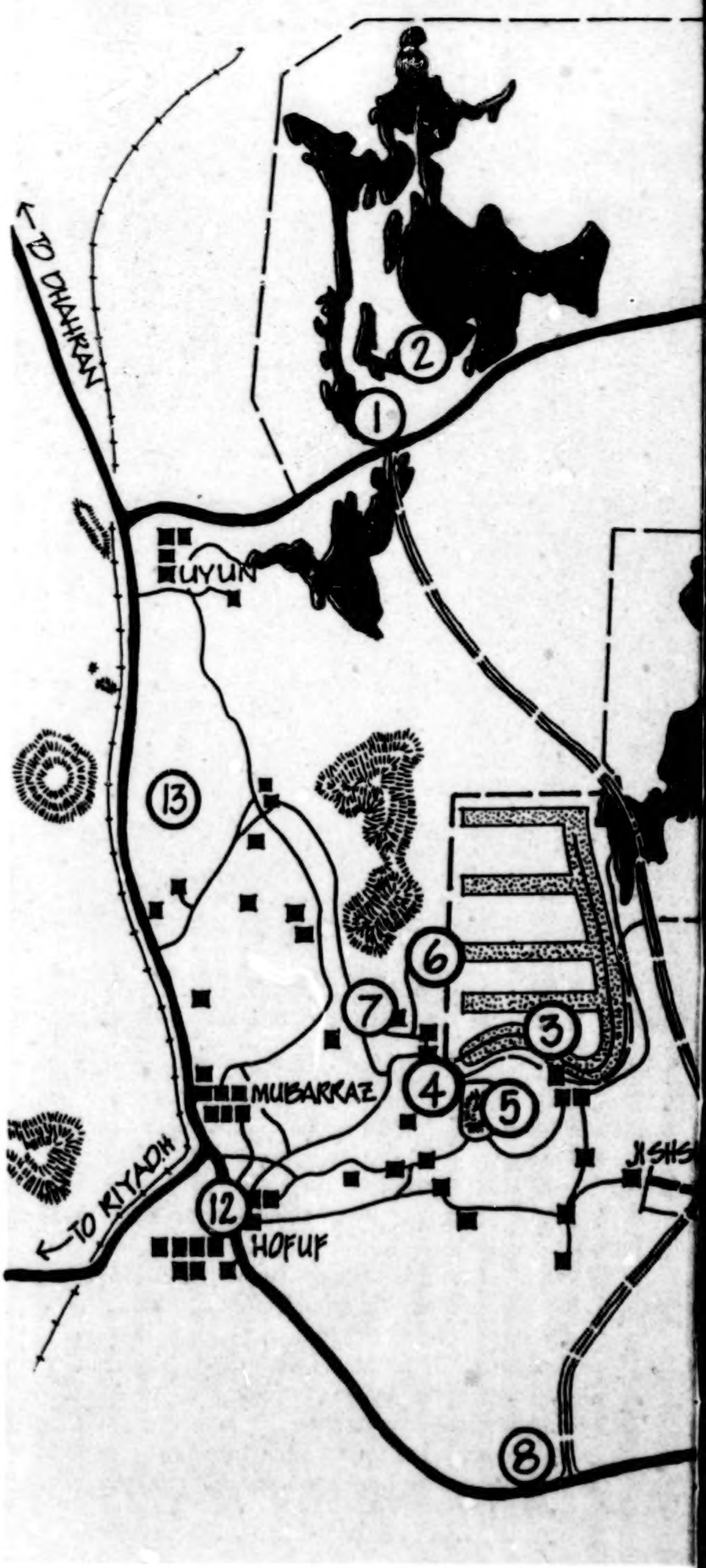

The total estimated cost of development for this latter group of sites is 1,178,000 SR, and they comprise an area of roughly 33,300 hectares.

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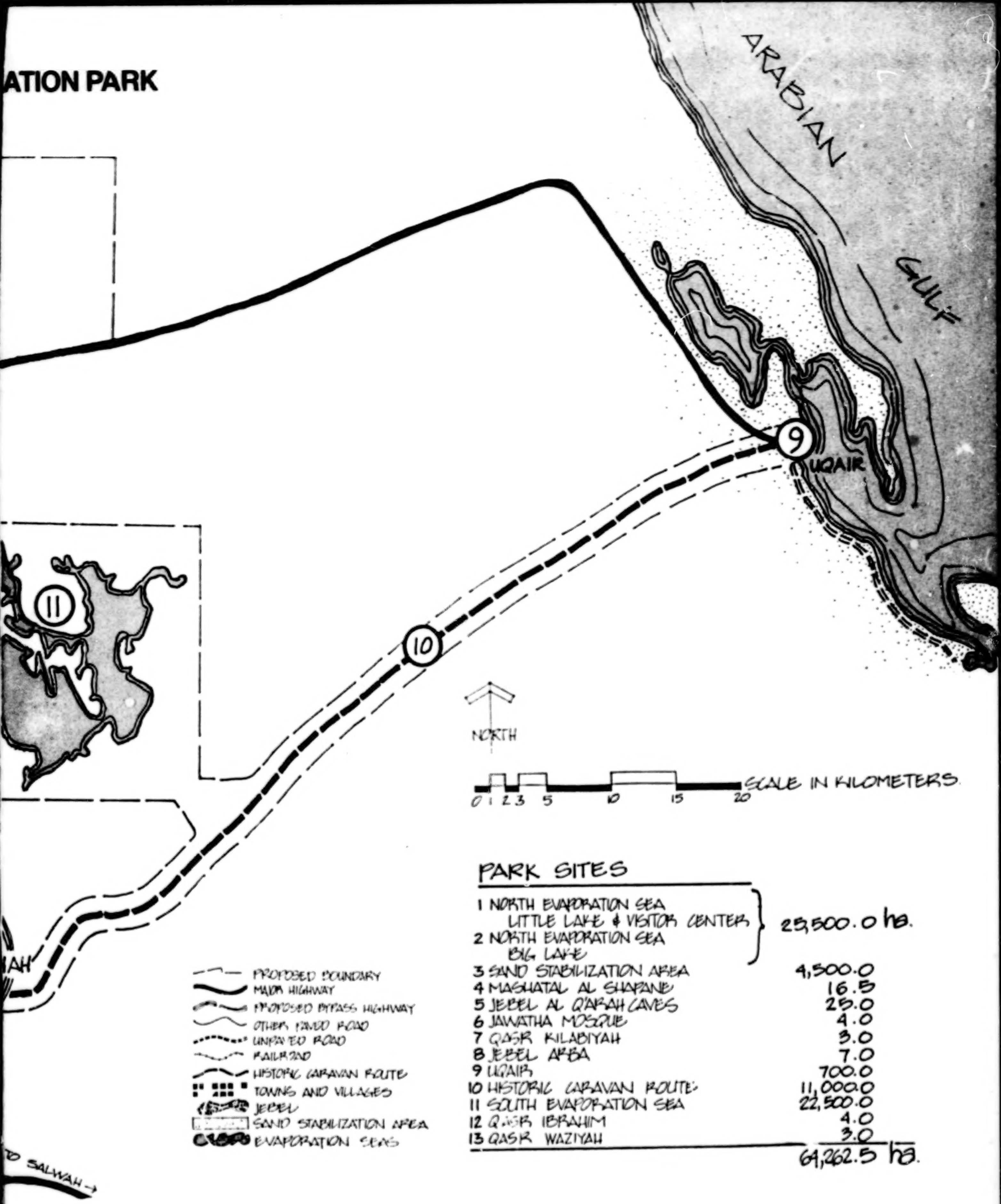


PARK SITES

1 NORTH EVAPORATION SEA LITTLE LAKE & VISITOR CENTER 2 NORTH EVAPORATION SEA BIG LAKE	25,500.0 ha.
3 SAND STABILIZATION AREA	4,500.0
4 MASHATAL AL SHAPANE	16.5
5 JEBEL AL Q'ARAH CAVES	25.0
6 JAWATHA MOSQUE	4.0
7 QASR KILABIYAH	3.0
8 JEBEL ARBA	7.0
9 UQAIR	700.0
10 HISTORIC CARAVAN ROUTE	11,000.0
11 SOUTH EVAPORATION SEA	22,500.0
12 QASR IBRAHIM	4.0
13 QASR WAZIYAH	3.0
	64,262.5 ha.

Significant recreation potential also exists on privately owned lands adjacent or near to the public land areas identified in this report. Large groves of date palms, especially, appear suitable for recreation development. A study to determine the feasibility and desirability of developing complementary recreation facilities on those lands should be conducted.

Al Hassa/Uqair National Recreation Park

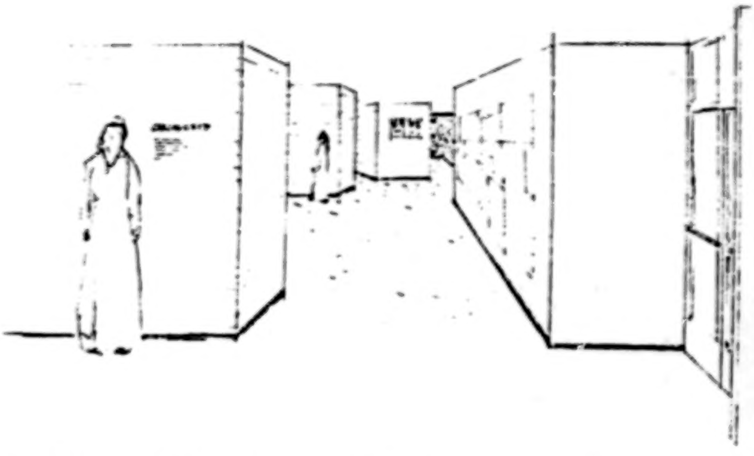
Sites	*Approx. Size (Hectares)*	*Current Administration*
Mashatal al Shapane	16.5	Sand Stabilization Project Ministry of Agriculture & Water (MAW)
Jawatha Mosque	4.0	Sand Stabilization Project Ministry of Agriculture & Water (MAW)
Sand Stabilization Project	4,500.0	Sand Stabilization Project Ministry of Agriculture & Water (MAW)
North Evaporation Sea	25,500.0	Hassa Irrigation and Drainage Authority (HIDA)
Uqair	700.0	Coast Guard
Q'asr Kilabiyah	3.0	Department of Antiquities and Museums, Ministry of Education
Jebel al Q'arah	25.0	Ministry of Municipalities and Rural Affairs
Al Hassa Hiking/Biking Trail	10.0	Various
Jebel Arba	7.0	
Q'asr Waziyah	3.0	Department of Antiquities and Museums, Ministry of Education
Q'asr Ibrahim	4.0	Department of Antiquites and Museums, Ministry of Education
Historic Caravan Route	11,000.0	Various
South Evaporation Sea	22,500.0	H.I.D.A.
Roadside Rests		
Totals	64,272.5	

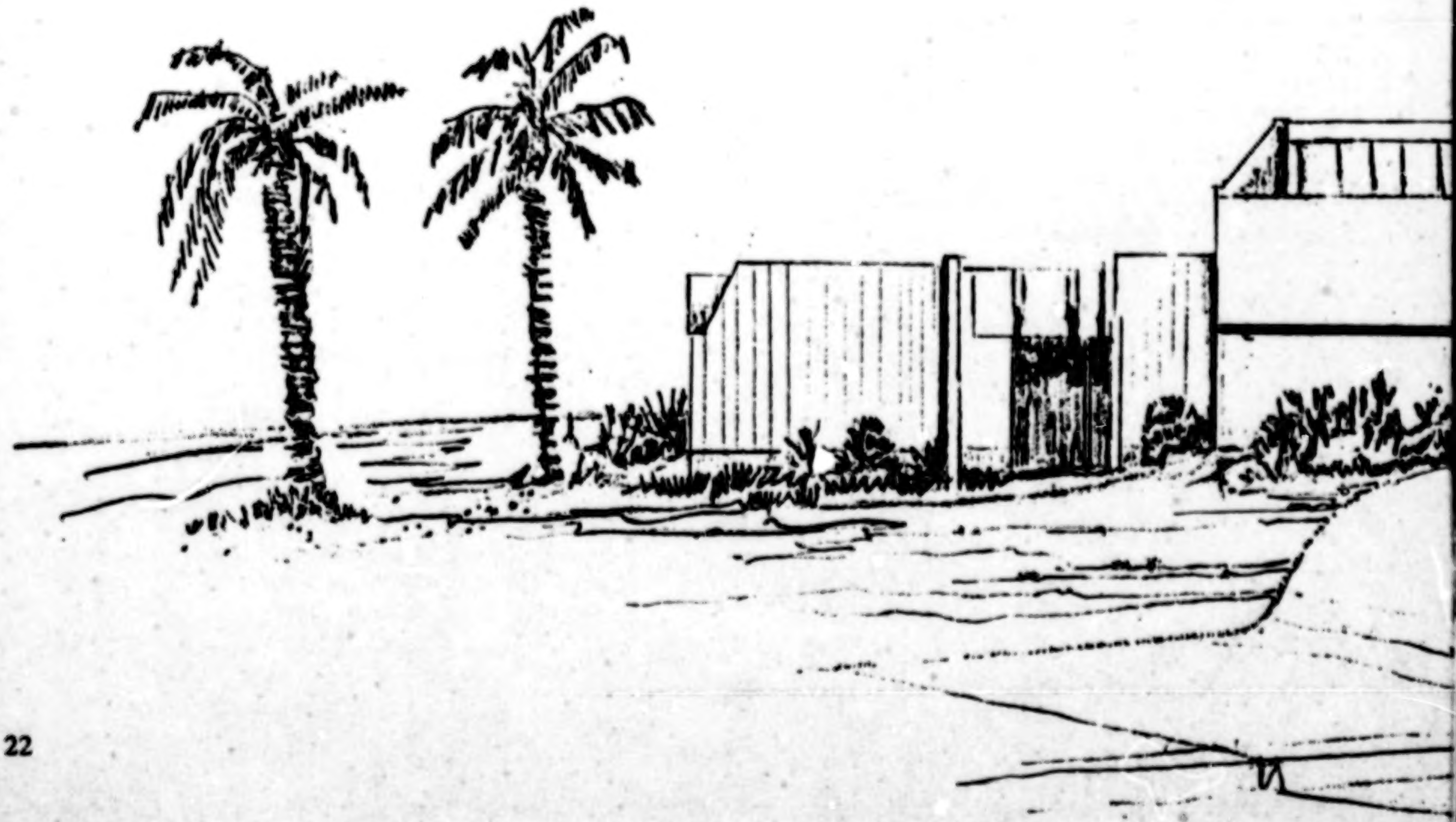
Proposed Facility Development-Summary	*Est. Cost (oooSR)*	*Cumulative Total*	
		Size	*000 SR*
New entrance; road paving; improved swimming pools; picnic/kaabsa sites; new and upgraded water closets, water distribution and storage; concession area; play fields; playground equipment; manager's residence; interpretive signs.	6,574	16.5	6,574
Rehabilitate walls around mosque site; redesign parking and circulation; picnic/kaabsa sites; water feature and playground equipment for children; water closets; interpretive signs.	1,250	20.5	7,824
Combined visitor center (with exhibits)/park headquarters complex; swimming pools/court games; botanical/zoological garden; camping area; picnicking area; improved water outfall tanks; residence area for park director, visiting dignitaries, and resident managers; park maintenance facility; trails; interpretive signs	4,847 11,462	4,520.5	12,671 24,133
Visitor center and exhibits; picnic sites and picnic pavilion; board walks and trails; camping sites; swimming lagoon; boating; bird watching; concessions; interpretive signs.	9,130 9,878	30,020.5	33,263 43,141
Swimming beach and fishing piers; camping sites, picnic/kaabsa sites; marina; fort stabilization; customs house restoration and adaptive use; concessions; interpretive signs.	22,960	30,720.5	66,101
Stabilization of fort; pool renovation; parking area; water closets; landscaping; interpretive signs.	880	30,723.5	66,981
Benches; shade structure for playground; trails; landscaping; cave lighting (future); interpretive signs.	398	30,748.5	67,379
Paved hiking/biking trail connecting recreation sites and other points of interest; interpretive signs; overpasses and underpasses (at road and canal crossings).	4,100	30,758.5	71,479
Paved access road and parking area; water closets; landscaping; trails, interpretive signs.	662	30,765.5	72,141
Water closets; parking; landscaping; interpretive signs.	339	30,768.5	72,480
Interpretive signs.	25	30,773.5	72,505
Concession development; wayside exhibits.	25	41,772.5	72,530
No immediate facility development proposed.		64,272.5	72,530
Interpretive signs.	127	64,272.5	72,657
+ 15% Architecture & Engineering Design			83,556
+ 15% Contingency			96,089

Interpretation in Al Hassa/Uqair National Recreational Park

Interpretation is the key to providing visitors full appreciation and understanding of the recreation, natural and/or cultural resources of the park. Interpretation is the communication of various messages and ideas. A wide range of media are used including: facilities such as visitor centers, auditoriums and audiovisual alcoves, exhibit rooms, information desks, botanical/zoological gardens, and interpretive trails; interpretive devices such as exhibits, motion pictures, video tapes, slide programs and publications; and perhaps most importantly, trained individuals with interpretive skills, meeting and talking to visitors.

Together, all of the interpretive media provide visitors with the information and orientation they need to plan their park visits, and to utilize the park resources without harming those resources or themselves. The interpretive media also increase visitors' knowledge about park resources bringing them into closer contact with their natural and cultural heritage. The best and most effective interpretation goes beyond providing facts, and increases visitors' understanding and appreciation for the role of the park in the lives of the community and the Kingdom through being involved with the park's variety of resources. To enjoy the experience of praying at one of Islam's oldest mosques; to hear and see the fascinating variety of marsh wildlife; or to stand atop the fortifications of the once powerful Ottoman empire only recently expelled from the Arabian Peninsula by Abdul Aziz Ibn Saud—all provide the best and most rewarding interpretive experience of all—individual communication with the resources. Specific interpretive media and programs to help achieve this experience are discussed in the proposals for recreational development at sites within al Hassa/Uqair National Recreation Area.





Visitor Centers

Two visitor centers are proposed for al Hassa/Uqair National Recreation Park; one at the Sand Stabilization Project and one at the North Evaporation Sea. These locations were chosen because of anticipated high visitor use, quality of potential recreation resources, potential for recreation development, and access from population centers. While park-wide interpretation is proposed for both visitor centers, this interpretation will be very different in character, reflecting the site resources and the anticipated recreation activities. The different approaches proposed for interpretation are reflected in specific site locations, architecture, and interpretive media.

Sand Stabilization Visitor Center

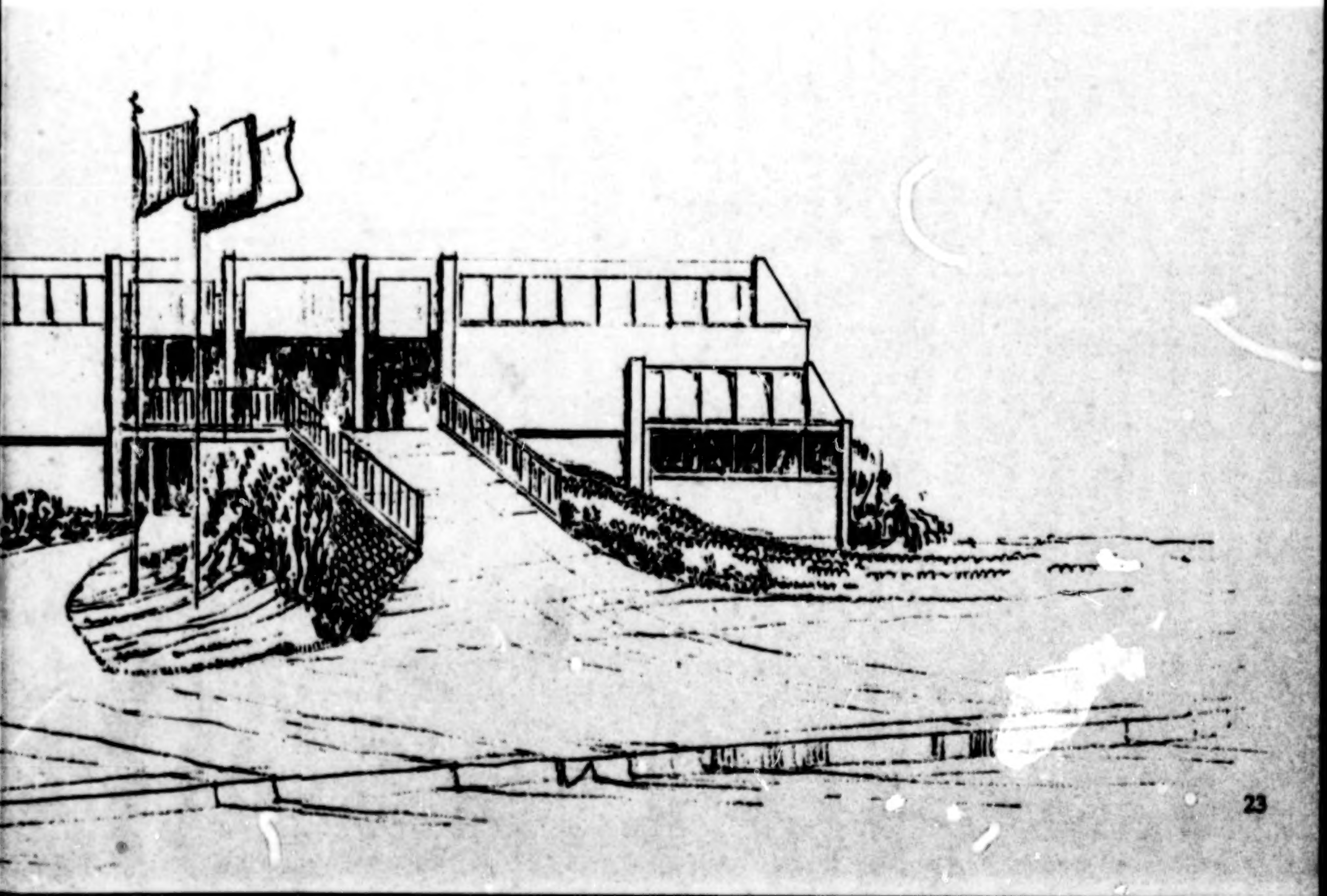
Location

The Sand Stabilization Visitor Center, situated in the same structure as park headquarters, would be located near the village of al Qarah, within the Sand Stabilization Project in a forested area at the edge of the desert. The setting is quiet and intimate; the structure would harmonize with this mood. Inside, interpretive media would direct visitors' attention to Sand Stabilization accomplishments and programs. For the park as a whole, interpretive programs would direct attention to special aspects of the scenic and historical resources, and would emphasize the more passive, family oriented recreation activities.

Architecture

An intimate architectural style is proposed to provide a structure that would blend easily into the Sand Stabilization forest. This style would also complement the interpretive concepts proposed for this visitor center. An observation deck is proposed which would provide views of forest and desert, and of the Sand Stabilization efforts.

The proposed structure would house park headquarters and the visitor center, with administrative offices occupying the ground floor and visitor use areas above.



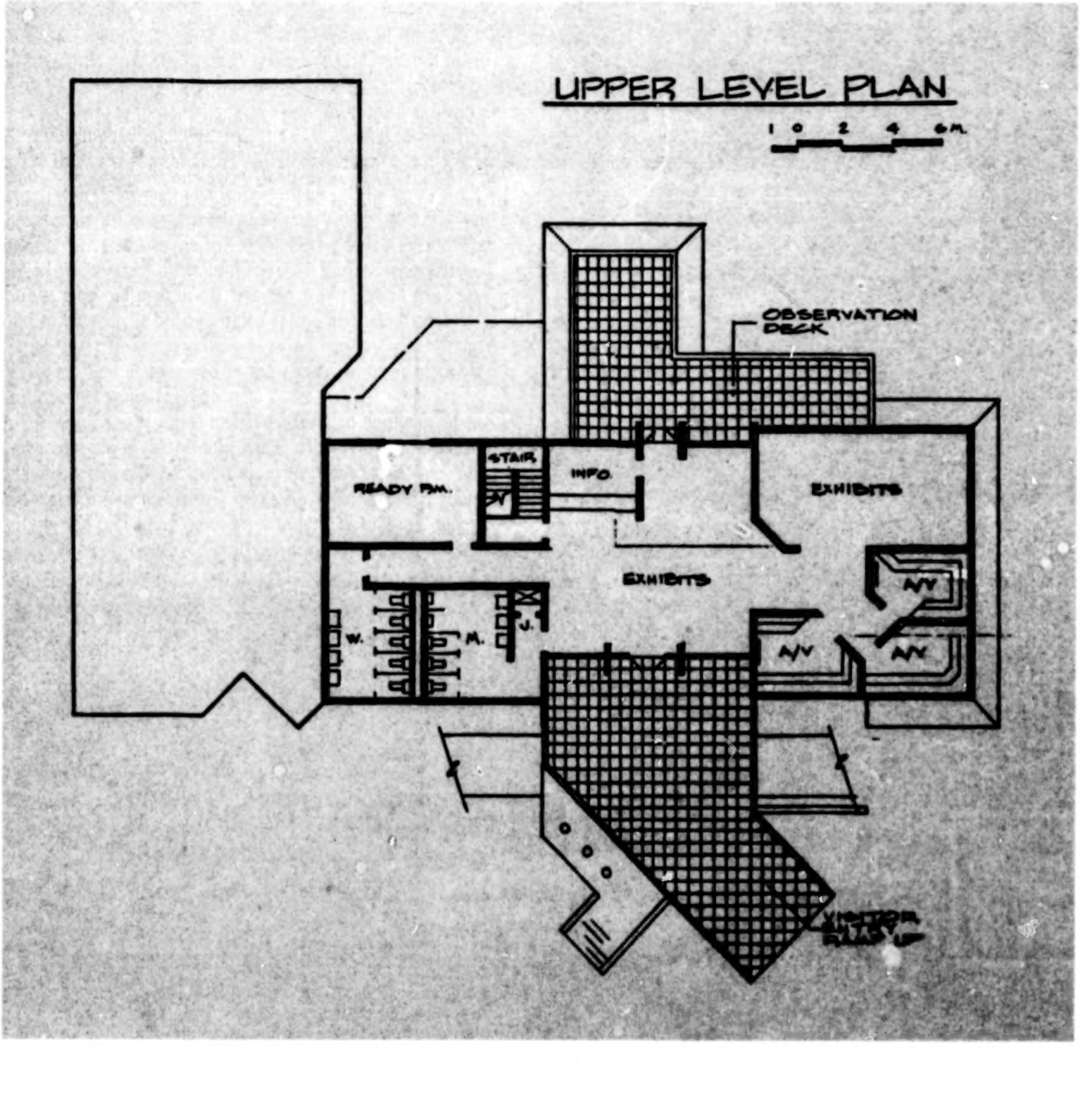
Visitor Use Facilities

A radial arrangement of facilities is proposed so that entering visitors would be able to easily identify the services and facilities that are available. Proposed facilities include water closets, information desk, publication sales area, a single exhibit alcove, three audiovisual alcoves with space for 12-15 visitors each, and an outdoor observation deck with rail-mounted wayside exhibits.

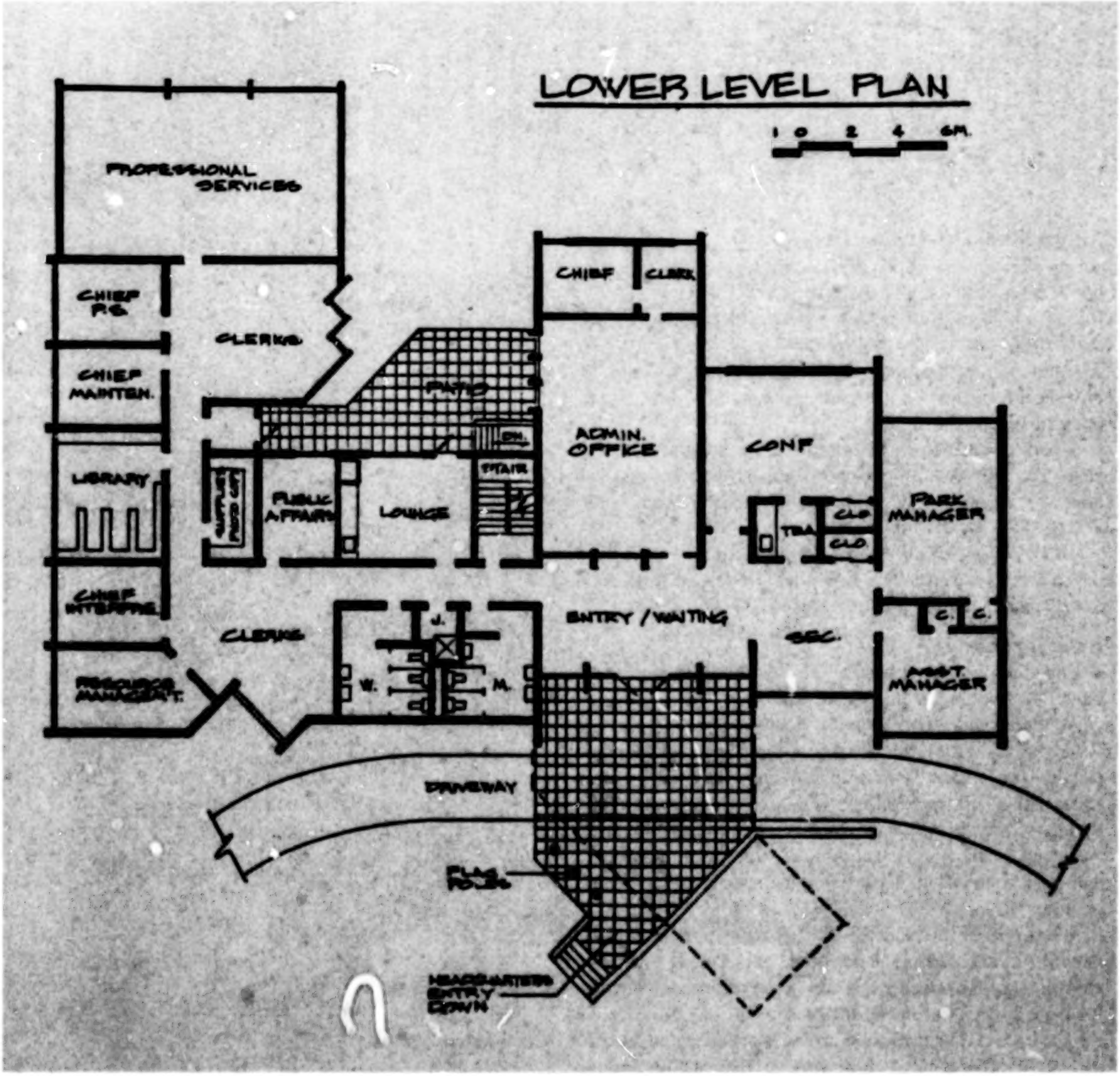
Interpretive Concepts

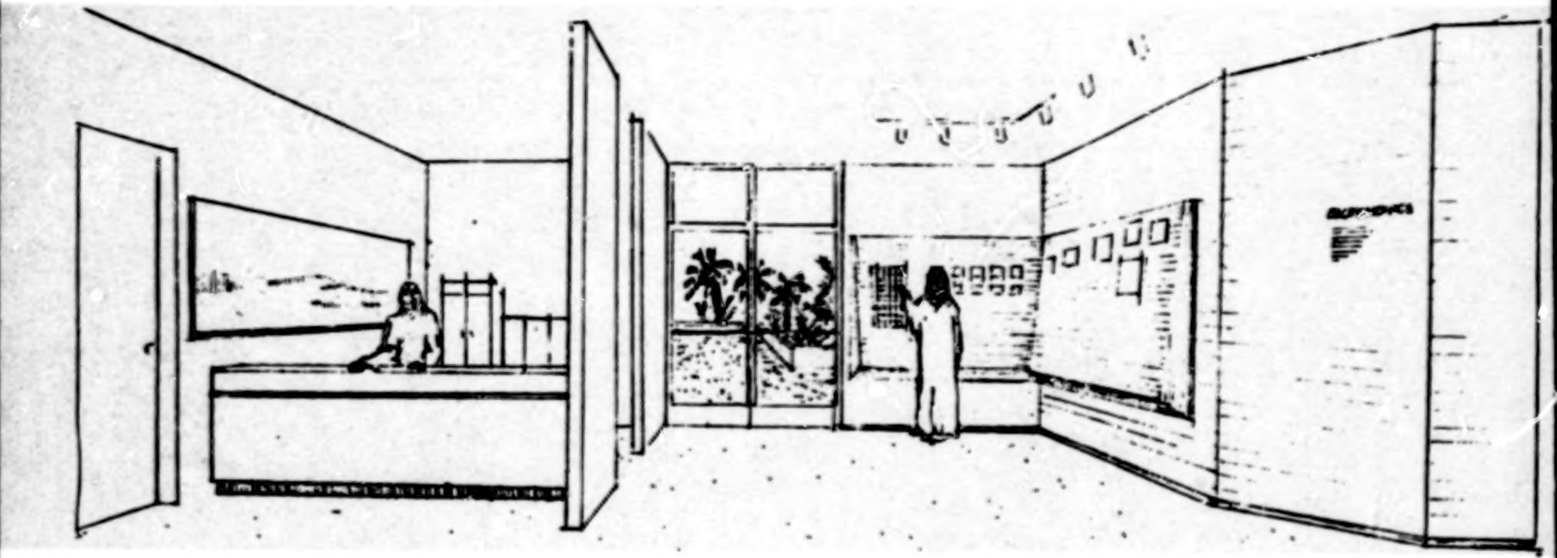
Proposed interpretive media would seek to establish a close relationship between park visitors and park resources. Emphasis would be placed on the quiet, contemplative values inherent in the park resources. The more passive family-oriented recreation activities would be emphasized.

The Sand Stabilization Project, its programs and accomplishments, would receive special emphasis.



The site and architecture of the visitor center, the design and function of exhibits, and the use of television in intimate audiovisual alcoves would work together to make the park and its resources more meaningful to visitors in a personal sense.





Information/Orientation Desk

An information/orientation desk would be provided where park visitors could talk directly with a park employee. Park folders would be available at the desk. The employee(s) on duty would also handle publications sales.

A bulletin board behind or adjacent to the desk would provide information on interpretive programs, weather, and other timely information.

A park orientation map would be displayed at or near the desk. The map would show park sites, major towns and villages, major roads, major topographic features, and a "YOU ARE HERE" symbol.

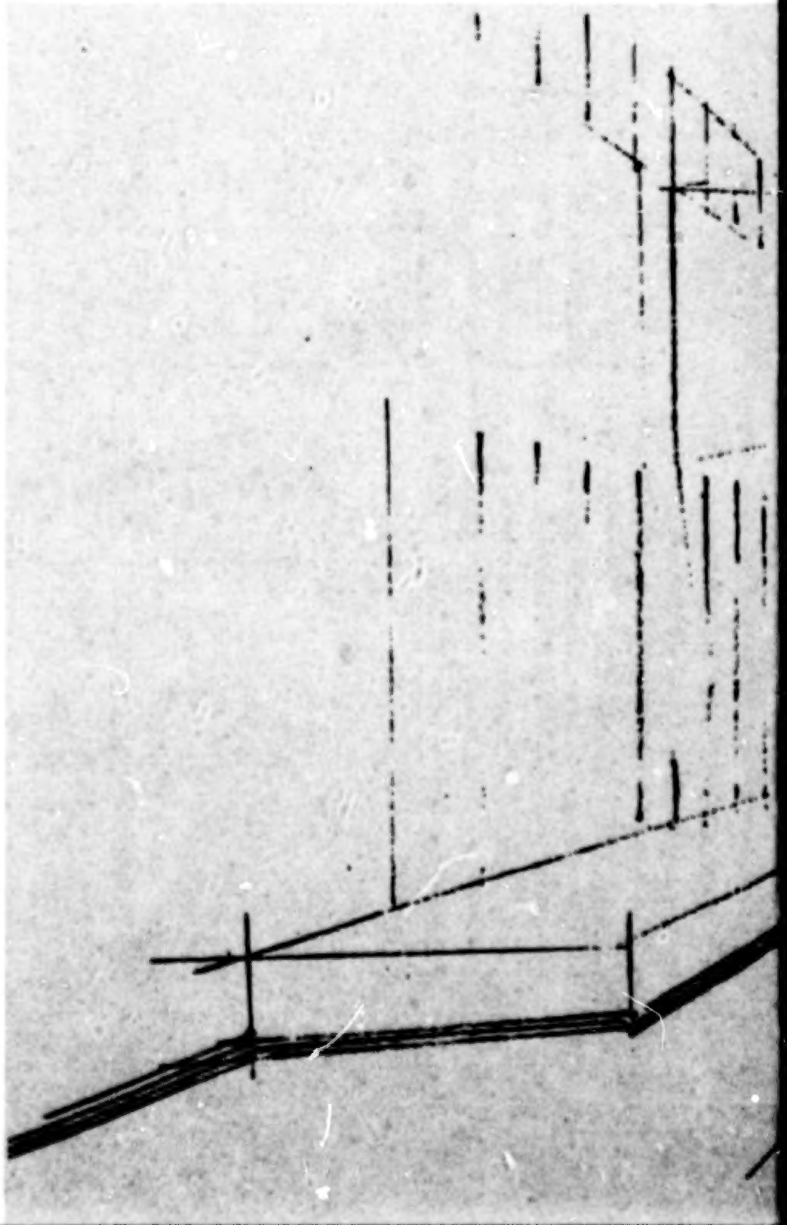
An al Hassa area map would be displayed at or near the desk. The map would show topographic features, roads and trails, major villages, and visitor use and services areas.

Exhibit Alcoves

A single exhibit alcove would provide exhibits interpreting Sand Stabilization and individual park sites. A slide program would be provided for children.

Sand Stabilization exhibits would provide geographic orientation for the area, for nearby park sites, and for the al Hassa Hiking/Biking Trail that would connect them. Graphics and written words would explain the historic problem presented by moving sand and focus on some of the steps that have been taken, emphasizing the results of these programs.

A series of small exhibits would provide interpretation of individual park sites. Exhibits should not attempt to provide an overview of each site (this can be accomplished better in the park folder), but should focus on a special natural or historic aspect of a site. Historic artifacts and/or reproduction of historic art works would improve exhibits interpreting his-



tory. Real objects greatly increase the credibility of exhibits and provide a strong focus for interpretation.

A visitor activated random select slide program would be provided for children. The program would emphasize park and recreation activities available for young visitors, e.g., swimming and wading, nature study, kite flying, fishing, sliding down dunes, the children's alcove at the North Evaporation Sea Visitor Center, soccer and volleyball, board games, and family activities. Operation of a random select unit by children is in itself a recreational activity.

Audiovisual Programs

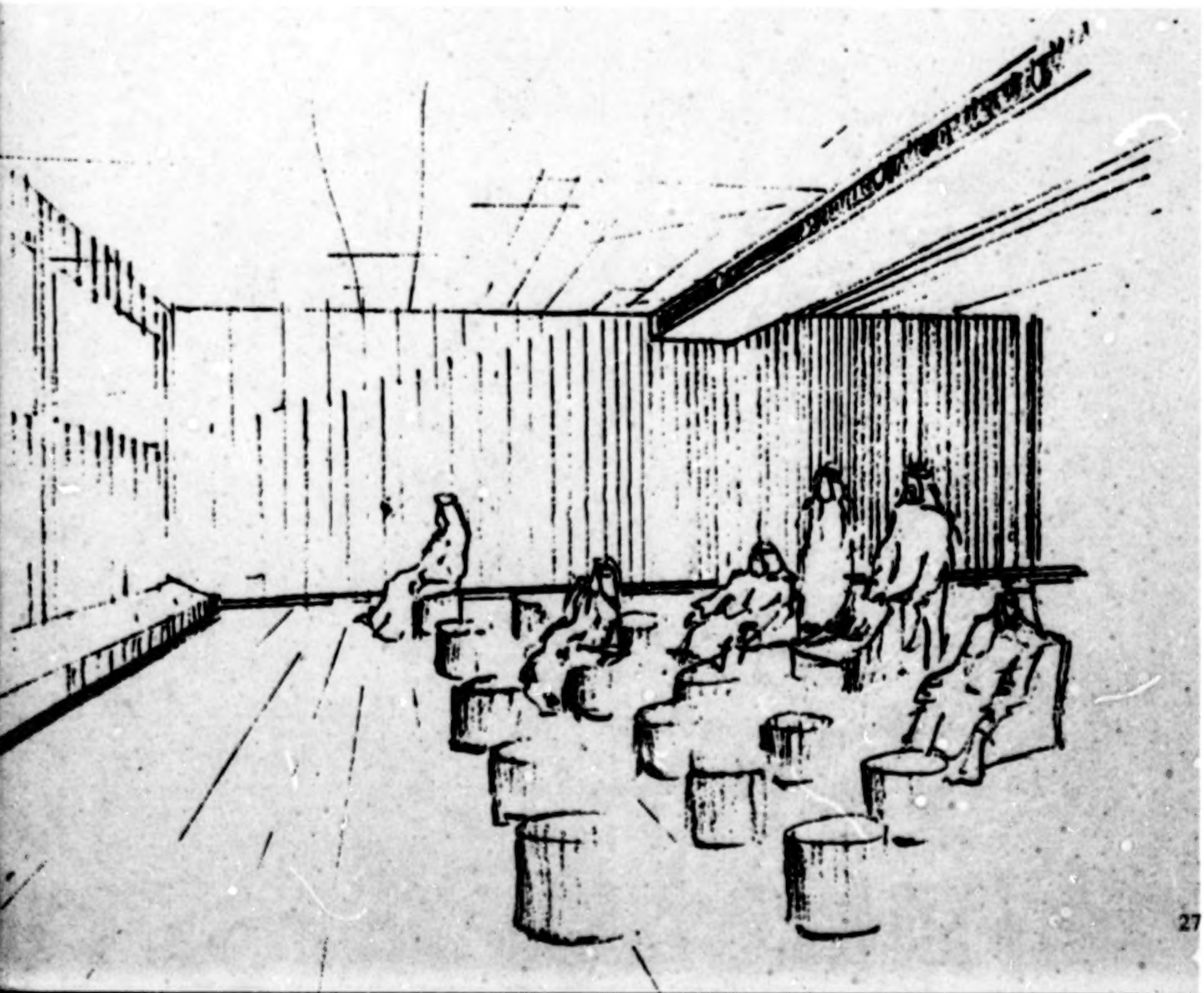
A 10-12 minute color/sound audiovisual program is recommended for viewing on videotape monitors in the three audiovisual alcoves. Informal seating—carpet, cushions, and benches against the walls—would be provided. The small screen and the small viewing alcoves would provide an intimate experience, complementing the tone of the program.

The program would project a quiet and contemplative mood. The narration would provide commentary on specific aspects of park sites. Al Hassa/Uqair would be interpreted as a single park whose individual sites have qualities that lend themselves to quiet introspection concerning the wonders of the natural world and the human activities that, taken together, constitute history.

Wayside Exhibits

Four or five wayside exhibits are proposed for the railings of the observation deck at the rear of the visitor center. The exhibits would interpret the surrounding environment—the trees and the desert beyond.

A visitor activated audio message repeater would be used with an exhibit about Sand Stabilization. Graphics would illustrate specific Sand Stabilization actions, while the audio narrative would provide the sequential story. Sequential stories are better narrated, while the graphics provide excellent support.

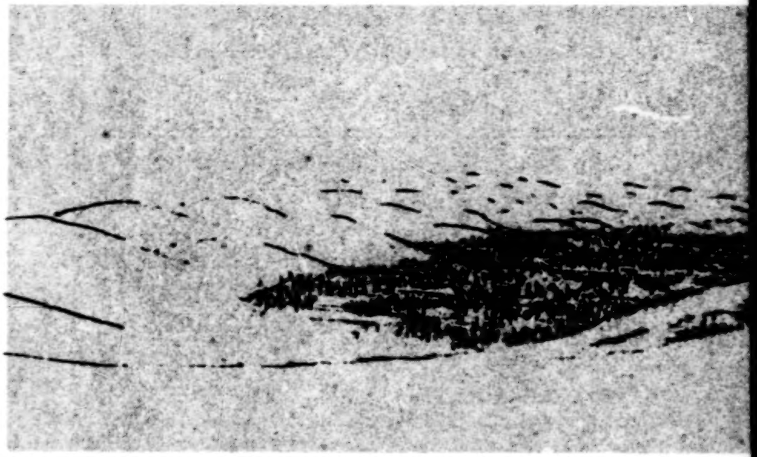


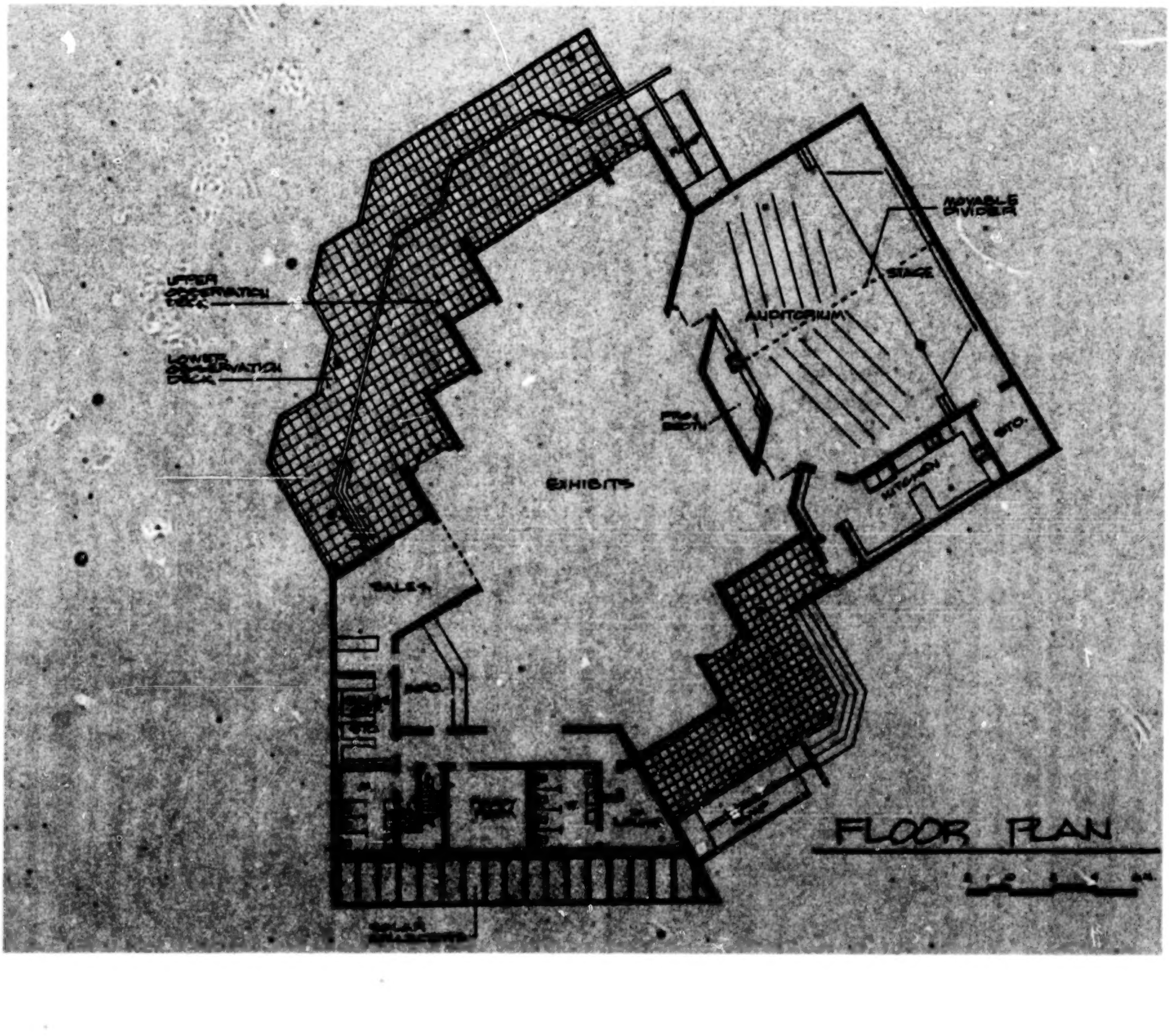
North Evaporation Sea Visitor Center

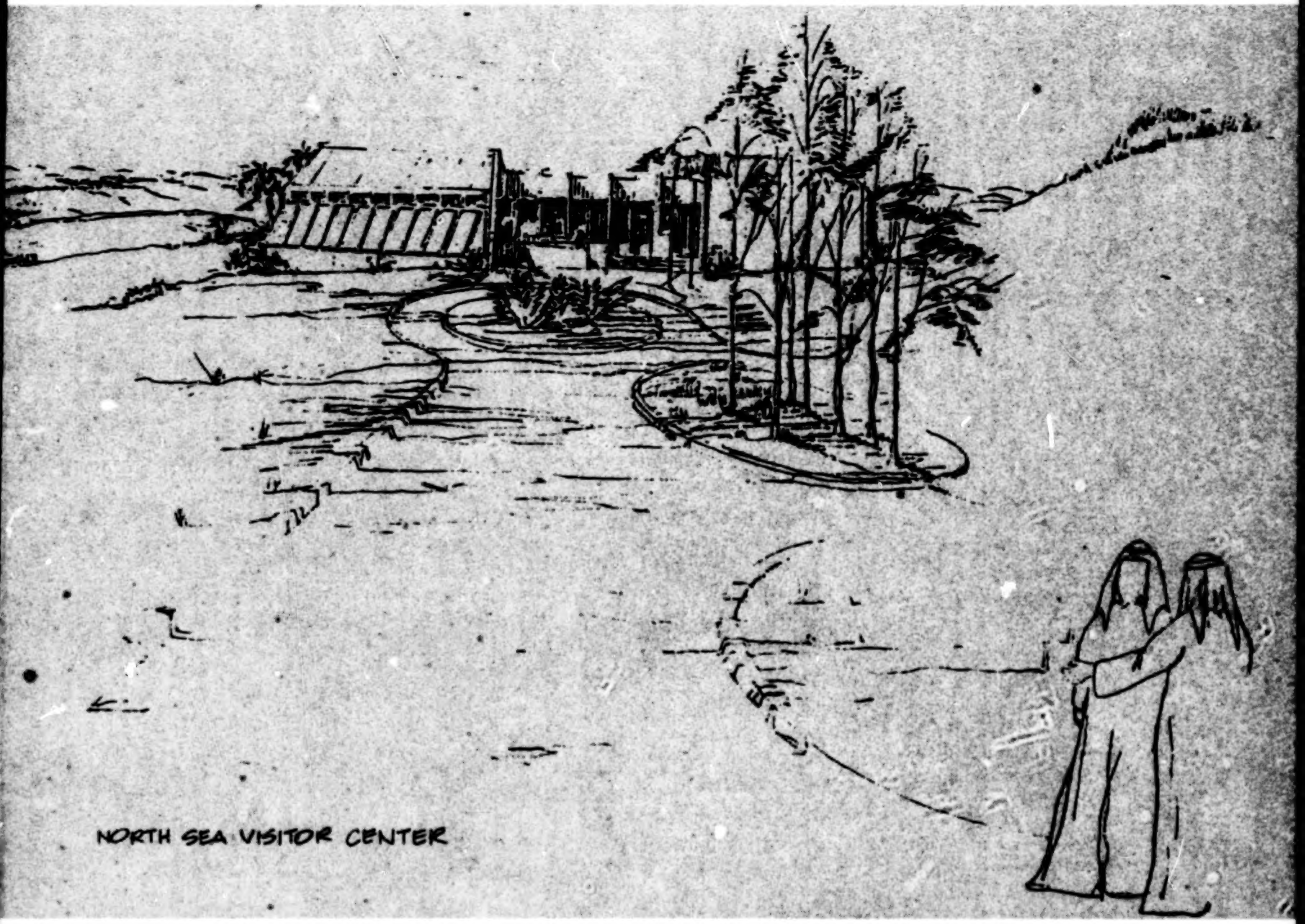
Location

The North Evaporation Sea is centrally located with respect to the Eastern Province road system and lies between major proposed park developments at al Hassa and Uqair. The proposed site, on the Uqair road about 10 kilometers east of the Hofuf-Dammam road, is readily accessible from al Hassa population centers and from areas as far distant as Riyadh, Kuwait, and Qatar. Visitors from north and west of the park most likely would come to this visitor center where information about the entire park would be available.

The proposed site is on top of a dune ridge intersecting the Uqair road at a right angle and overlooking the Little Lake portion of the North Evaporation Sea. In this location the visitor center would be visible for some distance.







Architecture

Architectural design should provide a structure that is bold, simple, and highly visible, complementing the natural scene and proposed interpretive concepts. An observation deck on the north side of the center would provide visitors with excellent views of the resource.

Visitor Use Facilities

A radial arrangement of facilities is proposed so that entering visitors will be able to easily identify the services and facilities that are available. Proposed facilities include rest rooms, information desk, publication sales area, three exhibit alcoves and a single Uqair exhibit, two 50-seat auditoriums, and an outdoor observation deck with rail-mounted wayside exhibits.

Interpretive Concepts

Proposed interpretive media would provide a broad overview of park resources and experiences, emphasizing the bold and striking aspects of the scenery, the active recreation opportunities, and the sweep of regional history. Some interpretive media would provide enjoyment through visitor participation, leading to the concept of enjoyment of park resources through active visitor participation.

The natural and recreation resources of the North Evaporation Sea would receive more interpretive emphasis than other park sites. Separate interpretation would be provided for Uqair.

The site and architecture of the visitor center, the design and function of exhibits, and the large image provided by a motion picture would work together to interpret the larger dimensions of scenery, history, and active recreation.

Information/Orientation Desk

An information/orientation desk would be provided where park visitors could talk directly with a park employee. Park folders would be available at the desk.

A bulletin board behind or adjacent to the desk would provide information on interpretive programs, weather, and other timely information.

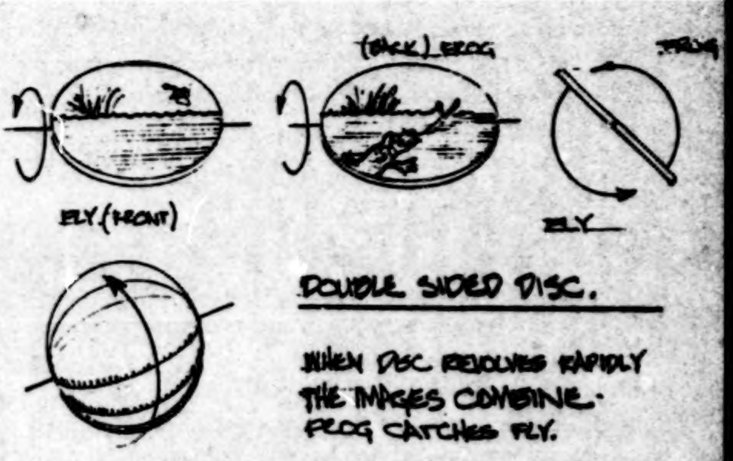
A park orientation map would be displayed behind or near the desk. The map would show park sites, major towns and villages, major roads, major topographic features, and a "YOU ARE HERE" symbol.

A North Evaporation Sea map would be displayed behind or near the desk. The map would show topographic features, roads, and trails, and visitor use and services areas.

Exhibit Alcoves

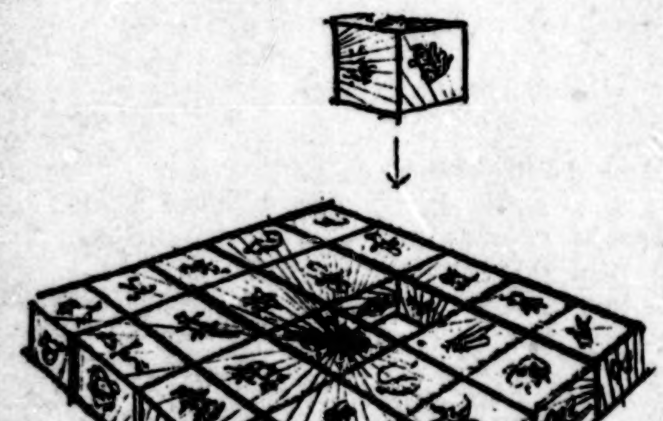
Three exhibit alcoves would provide three very different kinds of interpretation. Static exhibits would interpret the North Evaporation Sea, slide programs would illustrate the park's variety, and participation-learning devices would involve children.

In the North Evaporation Sea alcove, interpretation would tell what happens when water comes to the desert. There are three major habitats—underwater, marsh grass, and desert. Graphics, models of plants and animals, and written words would portray some of the life forms and some of the interrelationships that have developed since the basins started to fill. One section of the alcove would be devoted to the migratory birds that arrive in great numbers in spring and fall. Recreation activities can also be illustrated.



DOUBLE SIDED DISC.

WHEN DISC REVOLVES RAPIDLY THE IMAGES COMBINE · FROG CATCHES FLY.



ENVIRONMENTAL PUZZLE

PUZZLE MADE UP OF 25 BLOCKS WITH GRAPHIC IMAGES ON ALL SIDES WITH VISUAL ALIGNMENT CLUES. POTENTIAL FOR 6 GAMES.

In the slide program alcove, three visitor activated slide programs without sound would be available. Visitors would move the programs forward or backward and project each slide for as long or short a time as they wish. If three visitors are operating three programs simultaneously, the three images would recreate a changing collage melding the natural, historic, and recreation resources of the park. Slides might be captioned with one set in Arabic and another in English. This form of interpretation, in which a visitor "creates" a slide program, or in which three visitors together create a single multi-image program, advances the interpretive concept of active enjoyment of park resources.

The children's alcove would include a number of participation-learning devices. Many museums utilize such devices and there is a wide variety from which to choose. Examples include masked images, card flip "motion pictures," block puzzles, visitor activated random select slide projector, and a writing board on which children can create their own exhibits using colored markers. The devices would be designed so that children would have the fun of operating the device or solving the puzzle. The fun would rivet the children's attention so that the simple learning experience is effective. Each device provides opportunities for the child to learn about the park and its resources.

The Uqair exhibit would be much smaller than the three alcoves. The central exhibit feature would be a monitor displaying a short (five minutes or less) videodisc program illustrating some of the marine life forms of the Arabian Gulf. On the exhibit panel around the monitor, graphics and written words would provide information making a sound track (ineffective in the visitor center environment) unnecessary. A small map would be provided to locate Uqair relative to the rest of the park. The water-related recreation activities of Uqair would be illustrated.

Publications

Audiovisual Programs

A 10-12 minute color/sound, 16 mm motion picture, is recommended for viewing on screens in the two auditoriums. Such an arrangement would provide for a reasonably large screen to support the concepts proposed for the film, while insuring that all visitors would be close enough to the projected image for high quality viewing.

The film would bring together the diverse park sites with their varied resources and recreation opportunities. Water, its presence in relative abundance and good quality, would provide a unifying theme. The human and natural history, the agricultural and Sand Stabilization stories, and the recreation opportunities have been determined by water. In this film the emphasis would be placed on the larger aspects of the park: the bold sweep of history over 5,000 years, the conflict of man versus desert, the visual excitement of the landscapes, and the active recreation opportunities. Emphasis would be placed on general concepts rather than details.

The provision of two auditoriums would provide flexibility. While the film is being shown in one, the other is available for use by school or bus groups or special programs provided by the park staff.

Wayside Exhibits

Four or five wayside exhibits would be placed on the railing of the observation deck proposed for the rear of the visitor center. The exhibits would interpret the surrounding environment—the desert and the evaporation sea.

A visitor activated audio message repeater would be used with an exhibit telling how the evaporation seas came to be. Graphics would provide visual clarity for parts of the story, while the audio narrative outlined the major sequential steps.

A park folder would be available at the two visitor centers and at concessions facilities throughout the park. Sales publications would be available at the visitor centers. Concessioners would be encouraged to carry sales publications relating to the park and to natural and cultural resources.

Park Folder

The park folder would:

(1) Explain the concept of the al Hassa/Uqair National Recreation Park—joining the resources and the history of a number of park sites, both urban and natural.

(2) Provide information on the park and how to get to the individual park sites.

(3) Provide general information concerning the resources and recreation opportunities available at each site.

(4) Provide general information concerning the history and natural resources of the al Hassa/Uqair region.

(5) Call attention to hazards to be avoided and to park policies that visitors need to know.

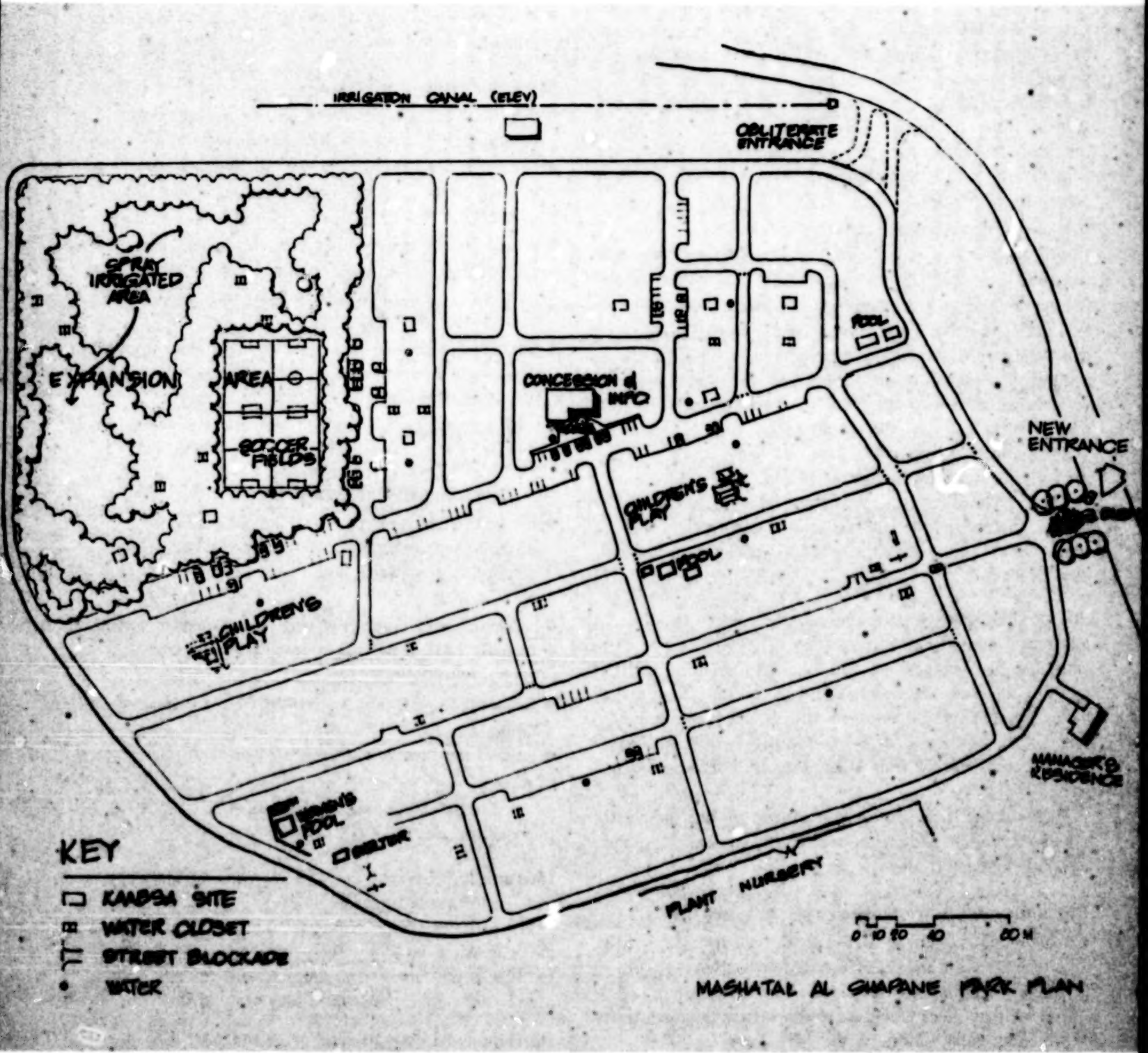
An easily amended mimeographed folder could be used for the first two years, so that the folder will not get ahead of park development, and so it can be changed to meet visitor needs as these evolve.

Sales Areas and Publications

Materials for sale in the visitor centers should include books, photographs, and posters. Subject matter may include the resources of the Kingdom; world and Kingdom national parks; flora and fauna of the Arabian Peninsula; deserts; coral reefs and marine life of the Arabian Gulf; history and archeology; and booklets related to specific recreation activities.

Mashatal Al Shapane Park

Site Description: Mashatal al Shapane already is an important public park and recreation area. Local residents and visitors from Riyadh, Dhahran, and as far away as Kuwait and Qatar enjoy bathing, socializing and picnicking at this site. It provides a much sought after green, shaded environment. The intensive use which this relatively small area receives is indicative of the great need and potential for use of outdoor recreation facilities in the Eastern Province. Mashatal al Shapane park has potential for much greater use with little adverse impact on the environment. It is a prime recreational resource and, at the beginning of park development, would be a focal point for park visitors.



Administration: Sand Stabilization Project, Ministry of Agriculture and Water.

Access: Located approximately 12 kilometers northeast of Hofuf on the Hofuf-Hulaylah road. The park lies one kilometer east of Hulaylah on the road to al Q'arah.

Approximate Size: 16.5 hectares

Existing Facilities and Use: The facilities at the park include three outfall tanks, simple water closets, and limited playground equipment. There is a plant nursery and general maintenance facility on the southern side of the park. A grid system of unpaved roads crisscrosses the park, one of which has been blocked off for use as a footpath. The northwestern corner of the park is undeveloped but has been cleared and graded for future development.

Irrigation water is pumped into the outfall tanks and is carried through the park by cement and earthen canals, which generally run parallel with the roads. Dikes along the canals are regularly opened allowing areas to be flood irrigated.

Park use is heavy and tends to be unstructured. The outfall tanks are used for bathing and swimming. The pool in the southwestern portion of the park is used exclusively by women, while the two other pools are used by men and children. The limited playground equipment—scattered slides and teeter-totters—receives heavy use. The mature trees (tamarisk, acacia, eucalyptus) provide a pleasant, shaded environment. Ground cover is sparse since the mature canopy blocks much of the sun and the area receives heavy foot traffic. Heavy automobile traffic on the unpaved roads raises dust throughout the park.

Proposed Development: Proposed development would maintain the passive character of the park by enhancing existing facilities and activities. Immediate plans being undertaken by the Sand Stabilization Project call for paving major roads, development of parking facilities, and conversion of many of the existing roadways to footpaths. These actions are in accord with the team's development proposals for this site.

Proposals for development at Mashatal fall into three categories: circulation and infrastructure, site enhancement, and new development.

Circulation and Infrastructure: It is proposed that:

- the entrance be moved southwest of the existing entrance to provide safer and easier access to and from the park. The new entrance would be wider than the existing one, and the park gates would be set back from the road, thus providing greater traffic visibility.
- certain park roads be blocked, thereby limiting vehicular access and directing traffic along major corridors. The blocked roads would be converted to foot paths.
- remaining roads be paved to reduce dust and improve access, paved parking areas be provided, and speed bumps be strategically located to reduce speed and create a safer, more enjoyable environment.
- water and electricity be made available at recreation sites in the developed areas.

Site Enhancement: It is proposed that:

- the outfall tanks be improved, either through refurbishment (tile, spray apparatus) or reconstruction.
- existing rest rooms be improved and new ones be situated throughout the park. A sewage disposal system should be developed.
- picnic sites be improved by providing seating areas, cooking facilities, water, areas for slaughtering animals and other kinds of food preparation activities, walls and plantings for screening and privacy.
- groundcover be improved or reestablished throughout the park, with shrubs planted around picnic sites, rest rooms and other facilities.
- trash receptacles be provided, their use encouraged, and regular pickups established.

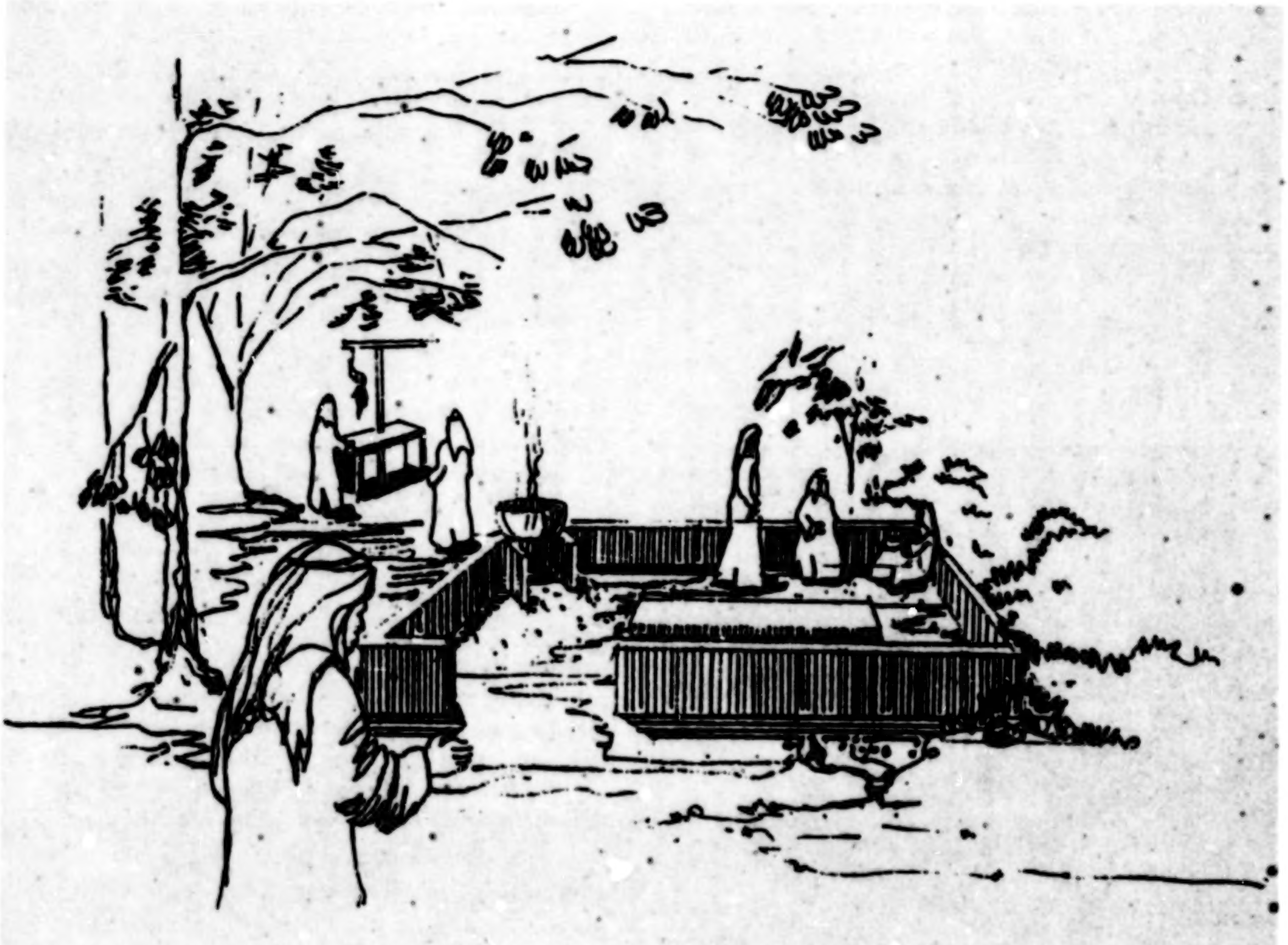
New Development: It is proposed that:

- the northwestern corner of the park be developed into an active recreation area providing lighted soccer fields, picnic facilities, water closets, and new plantings with a spray irrigation system.
- a concession building providing picnic supplies, locally manufactured items, and information be developed in a central location in the park.
- a manager's residence be constructed near the new park entrance.
- a water tower be constructed to ensure a consistent water supply.
- a parcourse exercise trail be developed around the periphery of the area.

Interpretation: Formal interpretive media are not recommended for Mashatal al Shapane.

The park orientation map panel should be mounted near the concessions building. The park folder would be available from the concessioner. The concessioner would be encouraged to sell publications which relate to the park.

Development Cost Estimate: 6,573,900 SR



PICNIC/KAABSA SITE

Jawatha

Site Description: Jawatha Mosque is reputed to have been constructed around 13 A.H. (635 A.D.). It is one of the most historically significant and sacred sites in the Kingdom. The Kaaba, or Black Stone, is claimed to have been held here after the Qarmathians removed it from Mecca. The site of the mosque, which has been covered by sands drifting from the north, marked a northern extension of the al Hassa settlement area. Only the upper arches of the mosque are above the present ground level, protected from further sand encroachment by walls and tamarisk plantings. The nearby village of Jawatha has been completely buried by sand. Jawatha Mosque is a place for prayer and meditation, while the vegetated area which encompasses it is suitable for family recreation.

Administration: Sand Stabilization Project, Ministry of Agriculture and Water.

Access: Located 15 kilometers east and north of Hofuf, with direct access provided by a newly paved, divided highway originating midway between the villages of Miqdam and Kilabiyah.

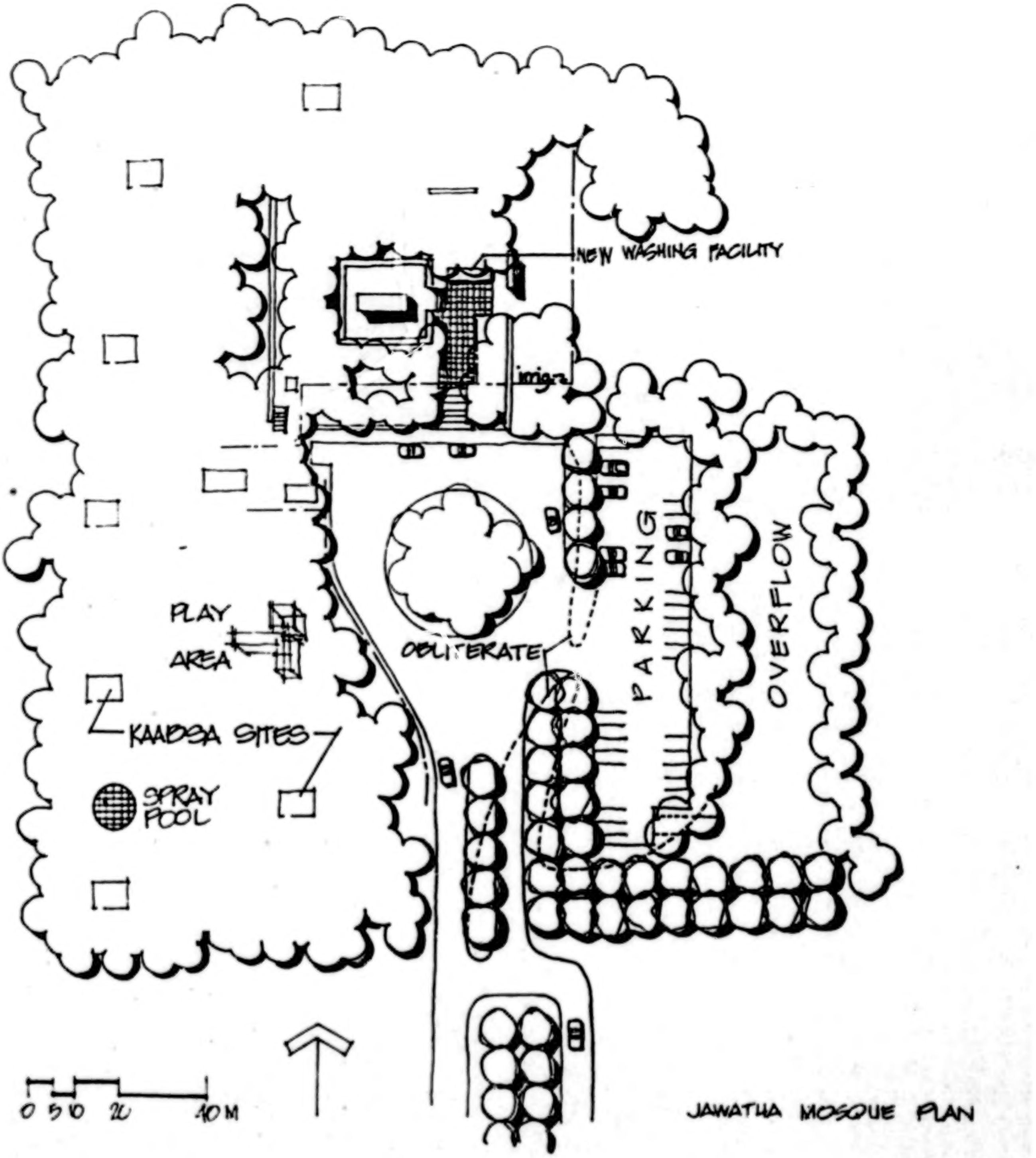
Approximate Size: 4 hectares.

Existing Facilities: An asphalt parking area for approximately 50 cars has been constructed along the eastern edge of the site. A pump supplies well water to a system of cement and earthen irrigation canals. A mature canopy of acacia and tamarisk covers much of the site, and provides a pleasant environment for contemplation, social gatherings, and picnics. A protective masonry canopy covers the exposed mosque arches. The mosque site is surrounded by a high cement block wall that needs repair.

Proposed Development: It is proposed that measures be taken to create, in the immediate vicinity of the mosque and enclosing wall, an atmosphere more appropriate to the religious significance the site has for Islam. This would be accomplished in part by enhancing existing structures and encouraging recreation use away from the immediate vicinity of the mosque by developing new facilities in the forested areas surrounding the mosque. This has the added benefit of allowing future archeological explorations of the mosque without disrupting the use of the recreational facilities.

Specific recommendations include:

- rehabilitating the canopy and the inner and outer walls around the mosque, the pumphouse, and irrigation system;
- developing an irrigated garden with sitting benches on the raised area immediately outside the walled enclosure;
- shifting the location of active forms of recreation, e.g., picnicking and children playing in water, away from the immediate area of the mosque and into the adjacent vegetated zone, thus creating a quieter, more contemplative atmosphere around the mosque. This shift in activity would be accomplished through proposed changes in the site's circulation patterns, installation of water closets, trash receptacles, formal day use sites throughout the vegetated area, a children's play area and fountain in the southwestern portion of the site, planting trees and shrubs around the parking area, and a new cleansing station near the entrance to the mosque;
- setting aside an area east of the parking lot for undeveloped camping in sand dunes adjacent to the site, with water centrally provided for campers.



Interpretation: Three wayside exhibits are recommended: At the parking lot, an exhibit would identify the site and welcome visitors, make them aware of the religious nature of the site and engender respect for the act of prayer, and inform non-Muslims that they should not ascend the prayer platform without invitation.

At the mosque entrance, just outside the wall, an exhibit would interpret the long history of the mosque.

In the day use area, near the boundary between the tamarisk plantation area and the desert, an exhibit would use the fate of Jawatha to explain the need for the Sand Stabilization Project.

The park orientation map panel should be displayed at the parking lot.

Development Cost Estimate: 1,250,100 SR

Sand Stabilization

Site Description: The protection efforts of the Sand Stabilization Project have produced an extensive area which is suitable for a variety of outdoor recreation and conservation education programs. This site would be one of the most significant recreation developments in the park. Recreation and interpretive facilities are proposed to create a showplace for the new al Hassa/Uqair National Recreation Park close to the most populated parts of the region.

The project area has two components: (1) the original twenty year old vegetated line of defense in the shape of an inverted "L" running east and then north, and (2) four more recent lines of defense, about eight years old, extending westward from the north-south line. These lines of vegetation, each about 0.3 kilometers wide, are separated by open areas of scenic drifting dunes with scattered small groves of trees. The lines of vegetation provide welcome shade and wind breaks, and complement the natural beauty of the adjacent dunes.

The large size of the area, the scenery, the forests of mature trees, the well developed road system, and the proximity to the population centers of al Hassa give the Sand Stabilization Project site tremendous potential for providing high quality recreation experiences for a large number of people. The location and pattern of afforestation in Sand Stabilization lends itself to zones of recreational use, with the highest density of use closest to Hofuf and areas with less development at the further reaches.

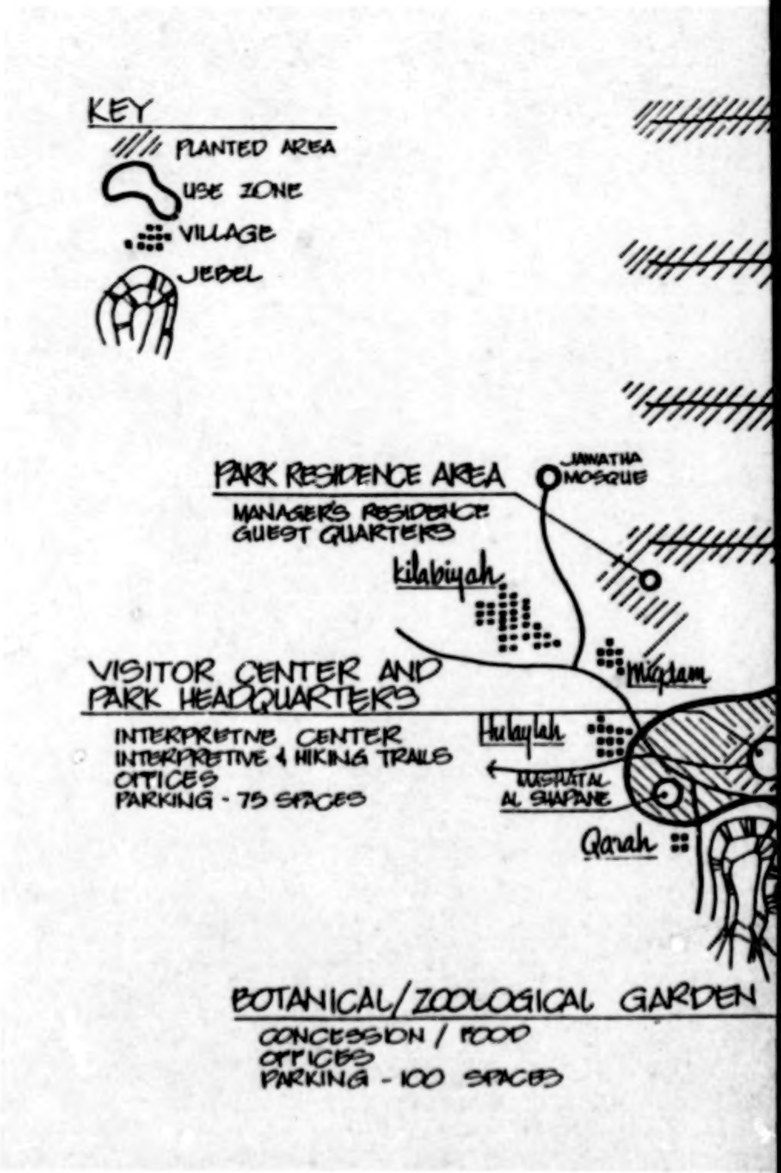
Administration: Sand Stabilization Project, Ministry of Agriculture and Water.

Access: The site is 15 kilometers east of Hofuf by way of the Hofuf-Hulaylah road and about 1.3 kilometers north of Mashatal Park.

Size: Approximately 4,500 hectares, with about 650 hectares forested.

Existing Development and Use: The site has forests, forest nurseries, 40 artesian springs and dug wells, 30 outfall tanks, an asphalt road and dirt feeder roads, irrigation canals, fences, agricultural support works, offices, and maintenance facilities. Although there are no developed recreational facilities at the site, many people use the outfall tanks for bathing and the forested area for picnicking.

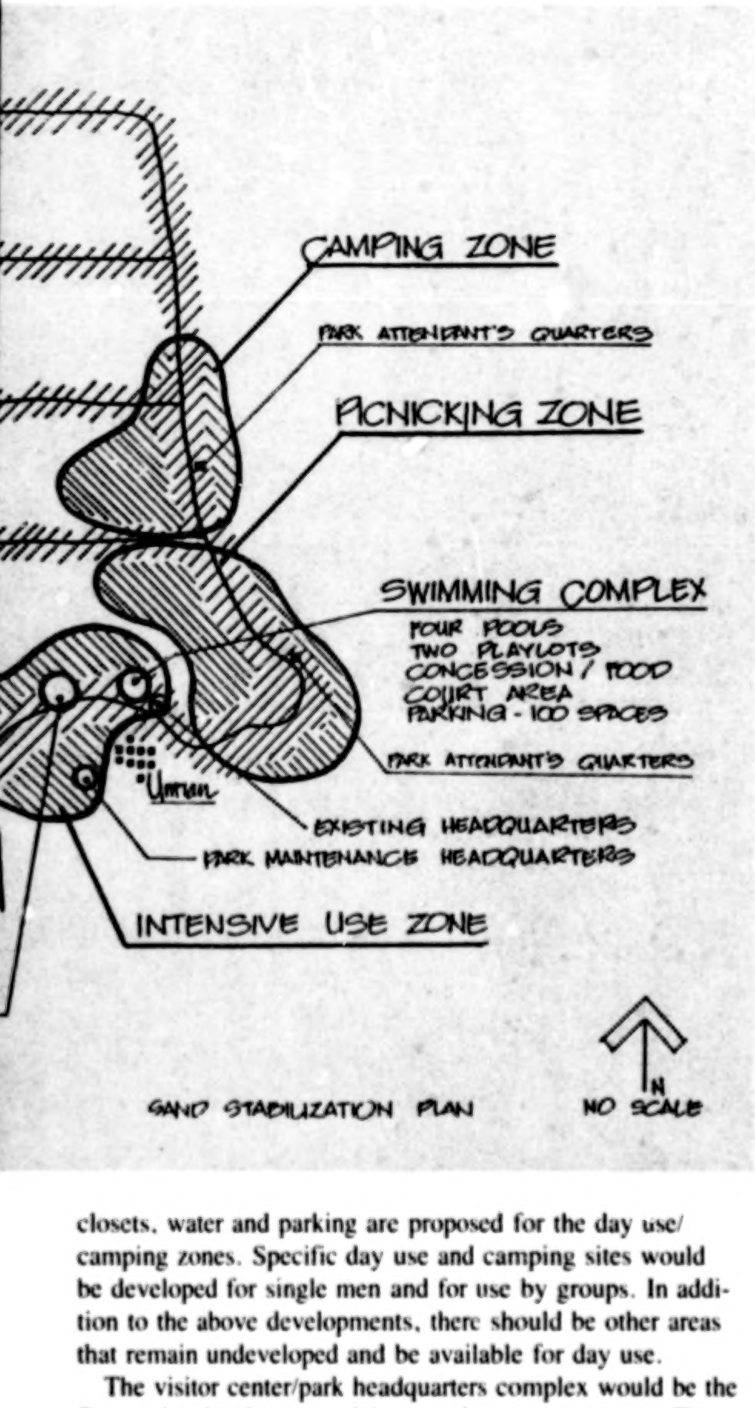
Proposed Development: The forests that stabilize the dunes provide excellent opportunities for varied, high quality recreation uses. An area of intensive development would be provided west of the existing sand stabilization headquarters. The proposed development would then move east and north to areas with less proposed development.



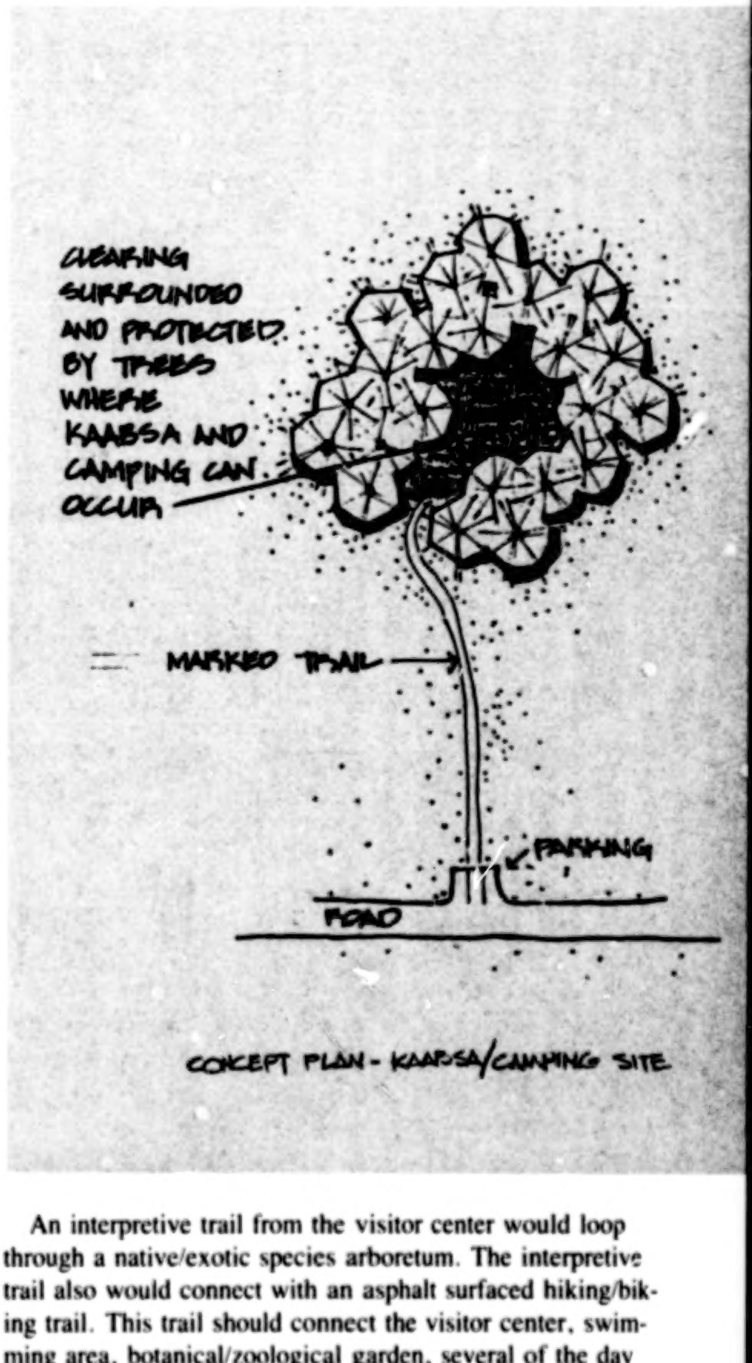
In the intensive use zone, development would consist of a visitor center park headquarters complex, swimming pools/court games area, a small botanical/zoological garden, and an expanded park maintenance facility.

Along the 13 kilometer long road that runs north of the present headquarters would be a picnicking zone and a camping zone.

Picnic/kaabsa and camping sites also would be developed in the unstabilized areas between the "lines of defense" where the scattered groves of vegetation offer seclusion. The facilities for this area should be temporary, allowing for the dynamic nature of the dunes and fitting into the primary management mission of the area, sand stabilization. Water



SAND STABILIZATION PLAN



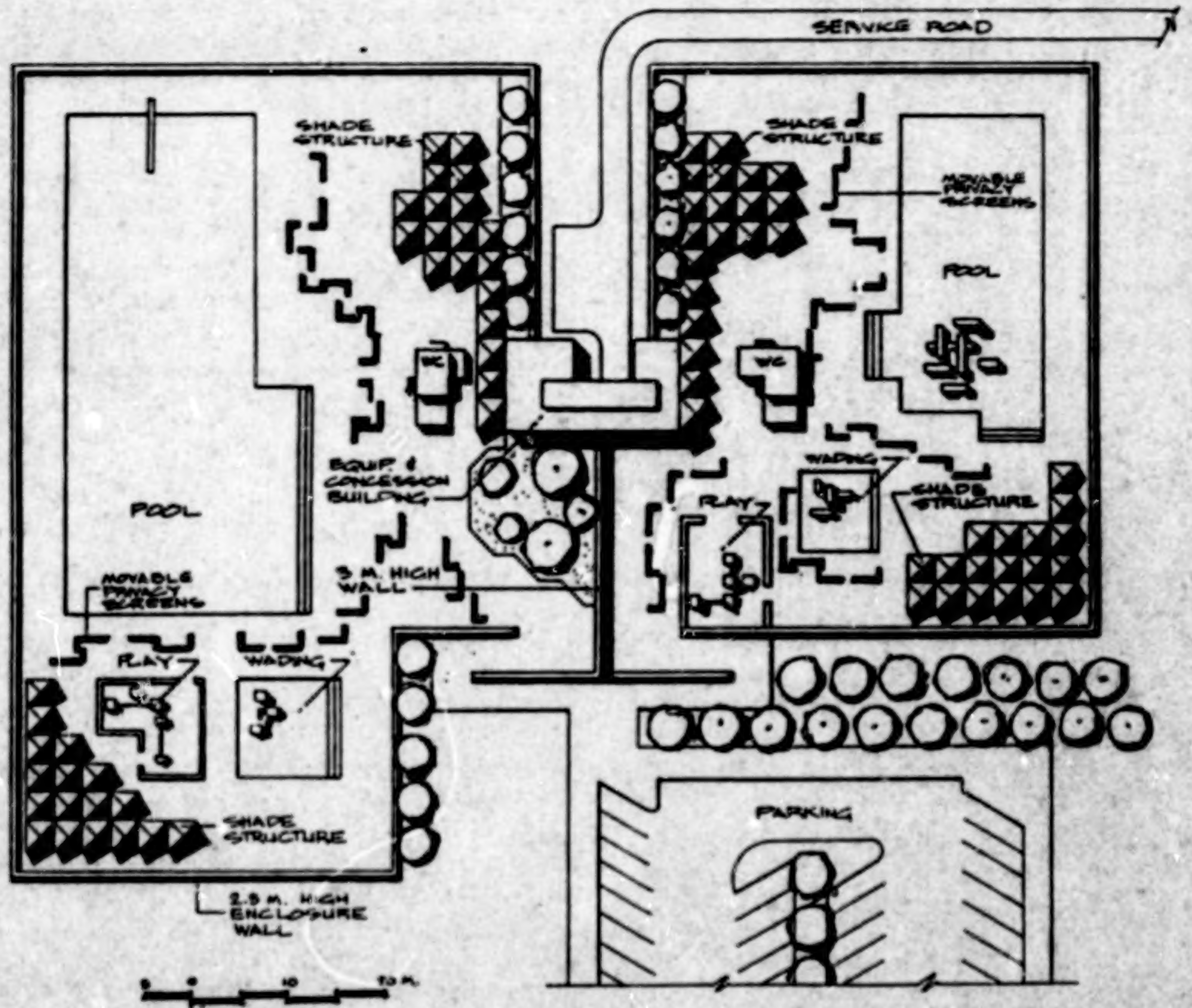
CONCEPT PLAN - KAABSA/CAMPING SITE

closets, water and parking are proposed for the day use/camping zones. Specific day use and camping sites would be developed for single men and for use by groups. In addition to the above developments, there should be other areas that remain undeveloped and be available for day use.

The visitor center/park headquarters complex would be the first major development visitors to the area encounter. The visitor center would command a view of the forested area with the active dunes in the background, vividly illustrating the contrasts between the dynamic and stabilized, and between desert and forest. The lower level of the visitor center would contain the park headquarters, housing the park management and administration offices.

An interpretive trail from the visitor center would loop through a native/exotic species arboretum. The interpretive trail also would connect with an asphalt surfaced hiking/biking trail. This trail should connect the visitor center, swimming area, botanical/zoological garden, several of the day use/camping areas, and follow a sand stabilization defense line to Jawatha Mosque. The main trail, with several side loops, would be approximately 25 kilometers long and would constitute a major element of the al Hassa district trail.

The swimming pools/court games areas would be another focal point for the proposed intensive development zone. Two major pools are envisioned for the initial development



SWIMMING COMPLEX · PLAN

phase. The olympic size men's pool would have room for bathing, lane swimming and swimming lessons. A children's area at the men's pool would have fountains/splash areas and slides. The separate and screened women's pool would be fairly shallow, essentially designed for wading. It would feature clustered blocks to sit on and several lanes for active swimming. A children's pool is also planned in conjunction with the women's pool. Each pool area would have separate showers, rest rooms, potable water, changing rooms, and separate access to a central concession area.

In this intensive recreation zone there also would be a number of courts for basketball, volleyball and tennis and a large open area for soccer and other field games. Equipment for the various games should be provided through the central concession facility. Also located in this intensive recreation zone would be several large playgrounds, featuring a variety of equipment and experiences.

A small (10 hectare) botanical/zoological garden would feature exhibits of native plant and animal species, with interpretation concentrating on how the species have adapted to the environment and how each relates to the overall ecosystem. The garden could house a discovery room where children and adults have an opportunity to handle animals, plants, and minerals. If, in a subsequent phase, locally extinct species such as the Arabian oryx and ostrich are reintroduced to the area around the South Evaporation Sea, the

garden could be linked to a fenced portion of the sea area which would become a drive through "safari" exhibit. In either the initial or later phases, there would be an area for the rental of horses/donkeys to ride over the dunes.

The park maintenance headquarters would be located southwest of the village of Umran at the present location of the Sand Stabilization Project maintenance facility. The headquarters would serve the maintenance needs of the entire Al Hassa/Uqair National Recreation Park. It would have, in addition to existing facilities, an area for vehicle maintenance and workshops for woodworking, plumbing, and electrical work.

A residence compound would be located in a forested area northwest of the intensive use area. The compound would consist of a superintendent's house, a visiting dignitary house and, perhaps, bungalows for park division heads. It would also be useful to have caretaker residences adjacent to heavy use areas in the park.

Interpretation: On-site interpretation would be provided by wayside exhibits. Because detailed development plans have not been prepared, the number of exhibits and their sites, and subject matter can only be estimated at this time.

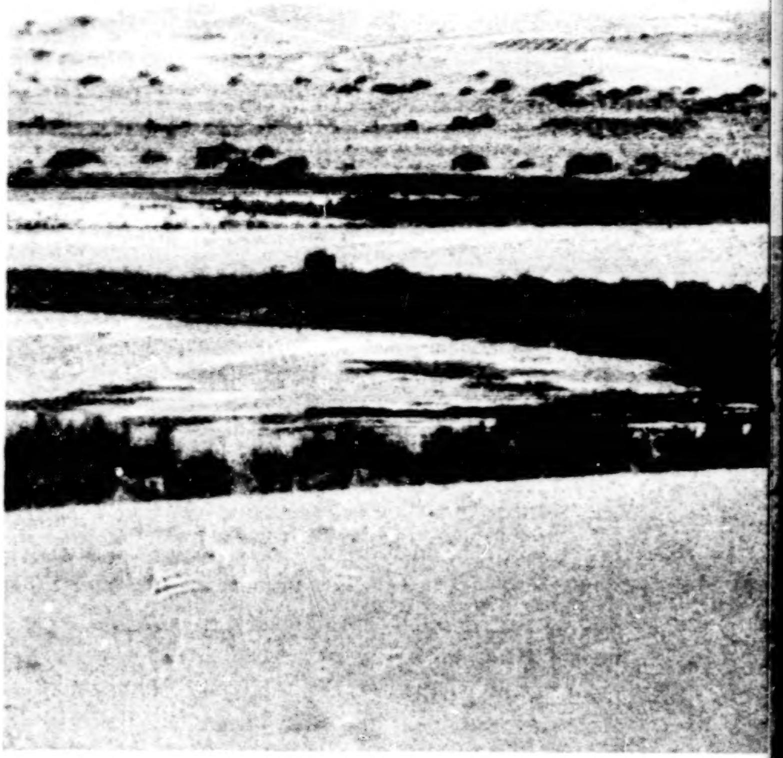
An interpretive loop trail has been proposed, beginning and ending at the visitor center. Approximately ten small wayside exhibits would be located along the trail, interpreting desert, agricultural, and Sand Stabilization features.

Wayside exhibits would provide identification and interpretation of the native plant and animal species to be exhibited in the proposed botanical/zoological garden. It is estimated that fifty small wayside exhibits would be required.

Other wayside exhibits would be located in Sand Stabilization to interpret features not present along the interpretive trail and features of particular interest. It is estimated that five such exhibits would be required.

Development Cost Estimate: 16,308,850 SR

North Evaporation Sea



Site Description: The North Evaporation Sea is a spectacular resource. The water, marsh grasses and other vegetation combine with the sand dunes to produce an exciting, unexpected aquatic experience. Encircled by active dunes, the North Evaporation Sea is an expansive area with several open bodies of water and areas of dense vegetation created by the run-off of irrigation water from the oases of al Hassa. The recent addition of water to the area has converted the desert sabkhahs into a lush marsh/lake environment. The sea's water levels vary during the year with the highest levels occurring during the winter season. The marsh waters and grasses support a wide variety of mammals, amphibians, fish and birds. In addition, the sea and its marsh grasses have become important resting areas for millions of birds that pass over the al Hassa area in their annual migration.

Administration: The north evaporation sea and surrounding area are public lands administered by the Hassa Irrigation and Drainage Authority, Ministry of Agriculture and Water.

Access: 38 kilometers northeast of Hofuf following the Dammam highway north, then turning east on the Uqair road.

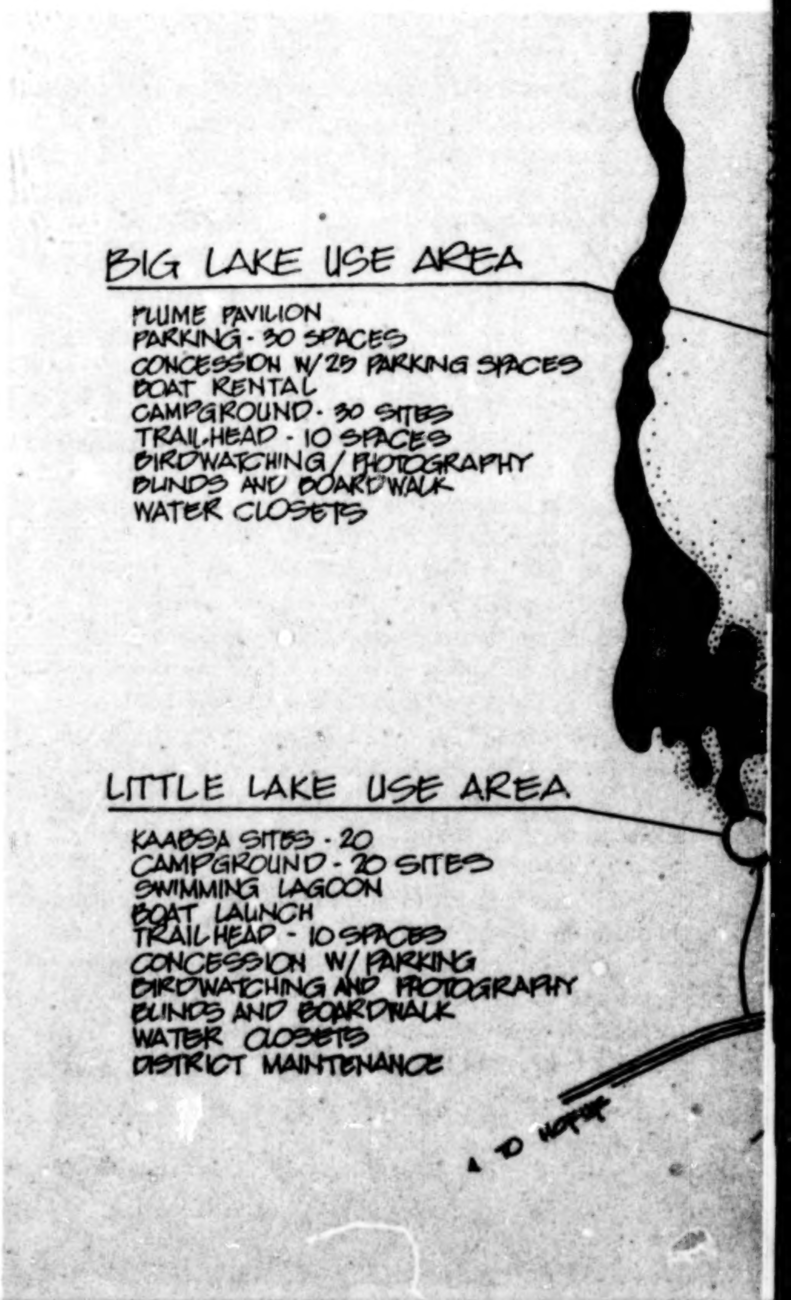
Approximate Size: The north evaporation sea and contiguous land occupy approximately 25,500 hectares.

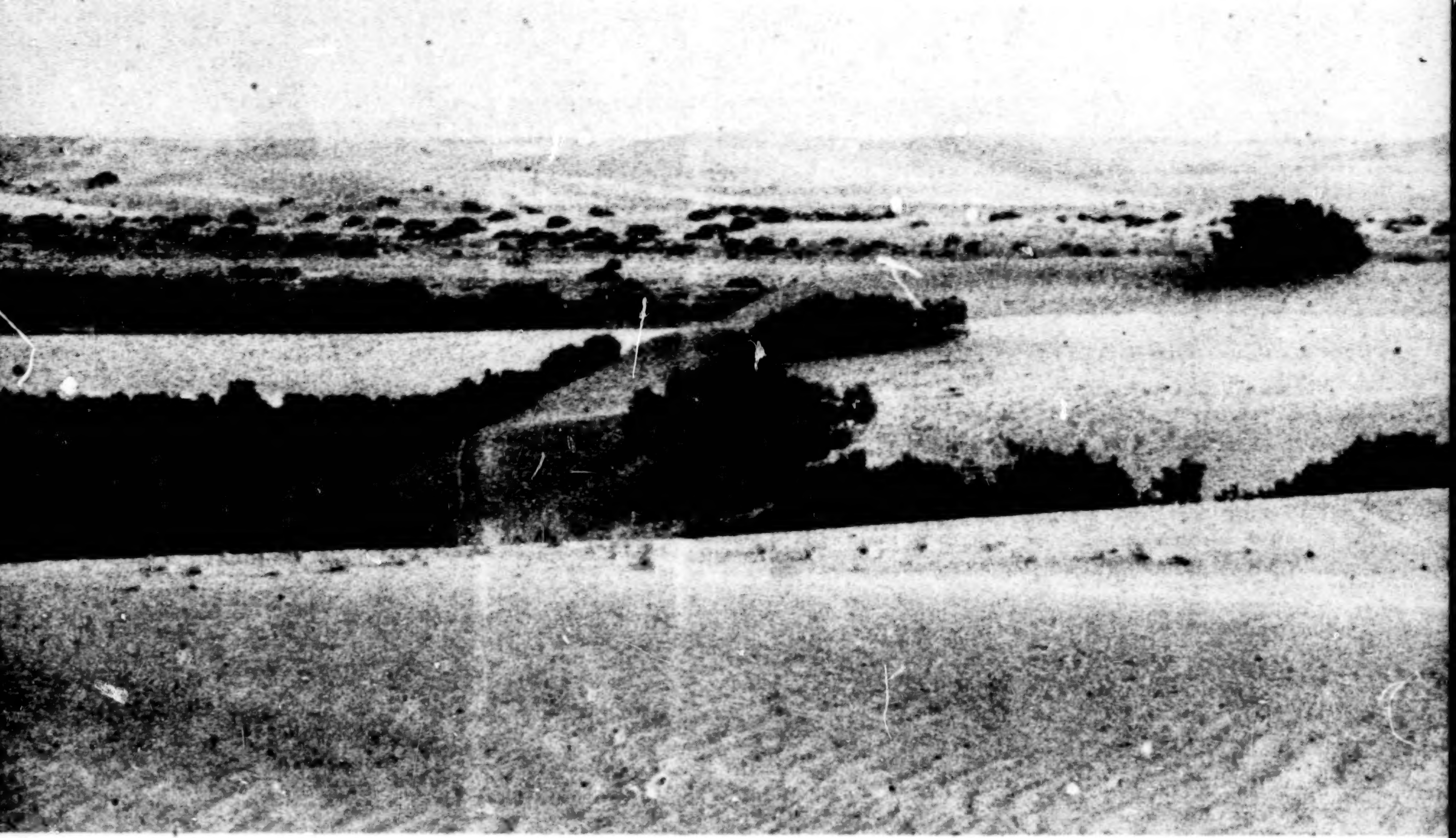
Existing Facilities and Use: There are no recreation facilities at the North Sea. The irrigation ditch which feeds the sea is paralleled by unpaved trails. Other scattered trails provide limited access to different parts of the area. Four-wheel drive and off-road vehicles are required for access to most of the area. Presently the area is used for picnicking, hunting, bird-watching and off-road vehicle use.

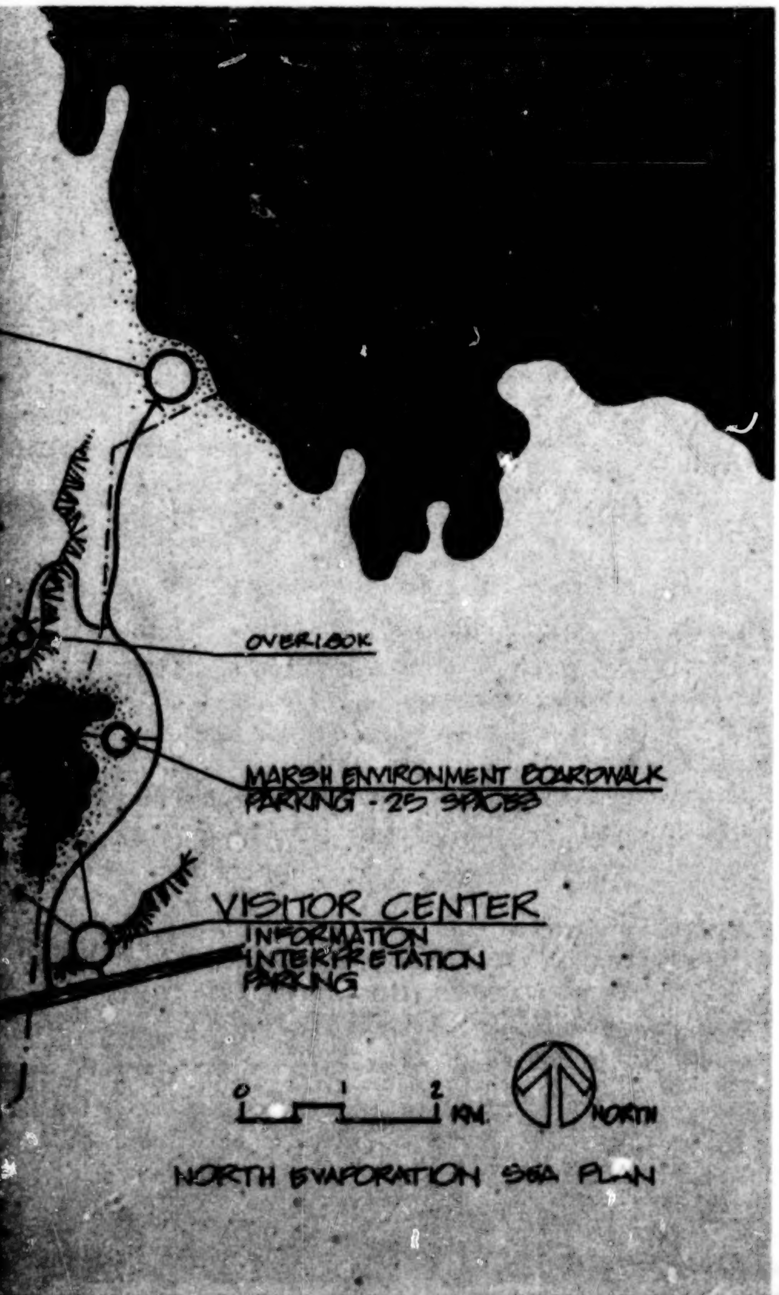
Proposed Development: The wide-range of park and recreation experiences being proposed for this special area would make this site, along with Sand Stabilization and Uqair, one of the major components of the al Hassa/Uqair National Recreation Park. In addition to the proposed visitor center, there would be three major zones of development: Little Lake north of the visitor center, Big Lake, and a recreation zone west of Little Lake.

The visitor center, to be situated in the dune area east of and overlooking Little Lake, would provide the visitor with a quick visual appreciation of the environment. The trail from the visitor center would lead the visitor to a series of boardwalks passing over and through the marsh introducing the visitor to the abundant flora and fauna. The boardwalk would have a number of blinds to facilitate the enjoyment and study of nature.

At Big Lake, one of the principal development features would be a water cooled picnic pavilion with a stream rushing through it. The pavilion would have a boardwalk extend-







ing over a lagoon of the lake. Adjacent to the pavilion there would be a series of day use sites, a parking area, rest rooms, and a concession facility selling picnic supplies. A boat concession would rent canoes and flat bottom boats for the aquatic trails. The concessioner could also provide guide tours using glass bottom boats to view the abundant aquatic life.

The recreation zone west of Little Lake would be created by sculpturing existing terrain to create land and water areas that are not affected by the seasonal water fluctuations. If a source of water suitable for swimming can be found, a sandy swimming lake could be created. Day use/camping sites would be developed between fingers of the stabilized lake with each shaded by groves of planted trees. West and north of the day use area a major concession area would be developed to provide small sail boats, food and camping items and horse/donkey rentals for dune riding.

Interpretation: On-site interpretation would be provided by wayside exhibits. Because detailed development plans have not been prepared, the number of exhibits and their sites and subject matter can only be estimated at this time.

An interpretive trail/boardwalk has been proposed for Little Lake. Approximately ten small wayside exhibits would be located along the trail, interpreting the life of the lake.

Four or five wayside exhibits would be mounted on the railings of the Big Lake pavilion, interpreting the lake, marsh, and desert visible from the site.

Other wayside exhibits would be located along the North Evaporation Sea road system to interpret features of exceptional prominence or particular interest and features not present along the interpretive trail. It is estimated that five such exhibits would be required.

Development Cost Estimate: 19,008,300

Al Uqair

Site Description: Al Uqair, located on the Arabian Gulf 70 kilometers south of Dammam, has the potential of becoming a major seaside resort. It is a place of history and a place for marine related recreation. Clusters of date palms are scattered along the beach. The warm water and easy access for much of the Eastern Province attract many people for recreation and leisure.

Evidence indicates that the Uqair vicinity includes the site of the legendary city of Gerrha, mentioned in historical texts as an important and wealthy trade center. A large fort and watchtower are tangible illustrations of the strategic importance the Ottomans placed on Uqair and the nearby spring of Abu-al-Zuhmul. The village also has played host to several notable meetings, e.g., the Protocol of Uqair held in 1920 to estblish the international borders of Kuwait and Iraq. The site's history extends back at least 4,500 years. Through the 1940s, Uqair served as a major port of entry for goods from Bahrain, India, East Africa, and other Arab States. Remains of the extensive customs facility still occupy a large portion of the shoreline of the village.

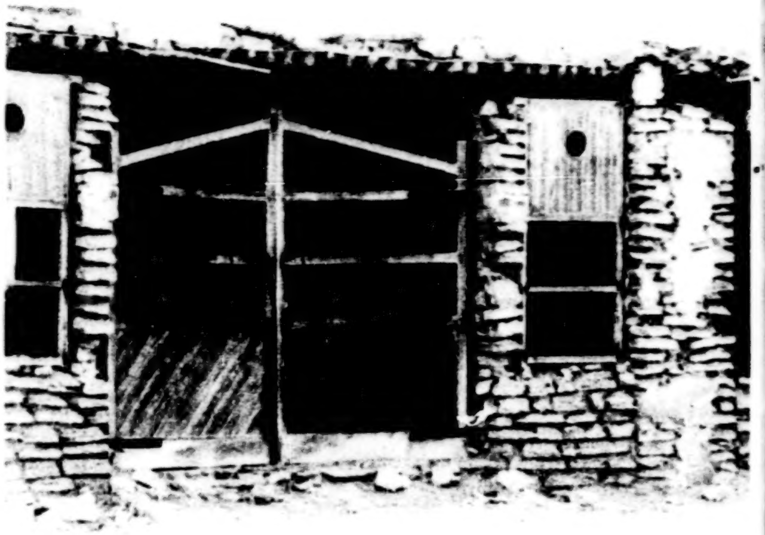
The present day village contains an operating coast guard station, an Amir's residence, and a small mosque. A second coast guard station is located about 25 kilometers south of the village and is accessible by a well graded, unpaved road.

The al Hassa/Uqair National Recreation Park would play a major role in revitalizing the village of Uqair.

Administration: The beaches south of Uqair are believed to be public lands, administered by the Coast Guard.

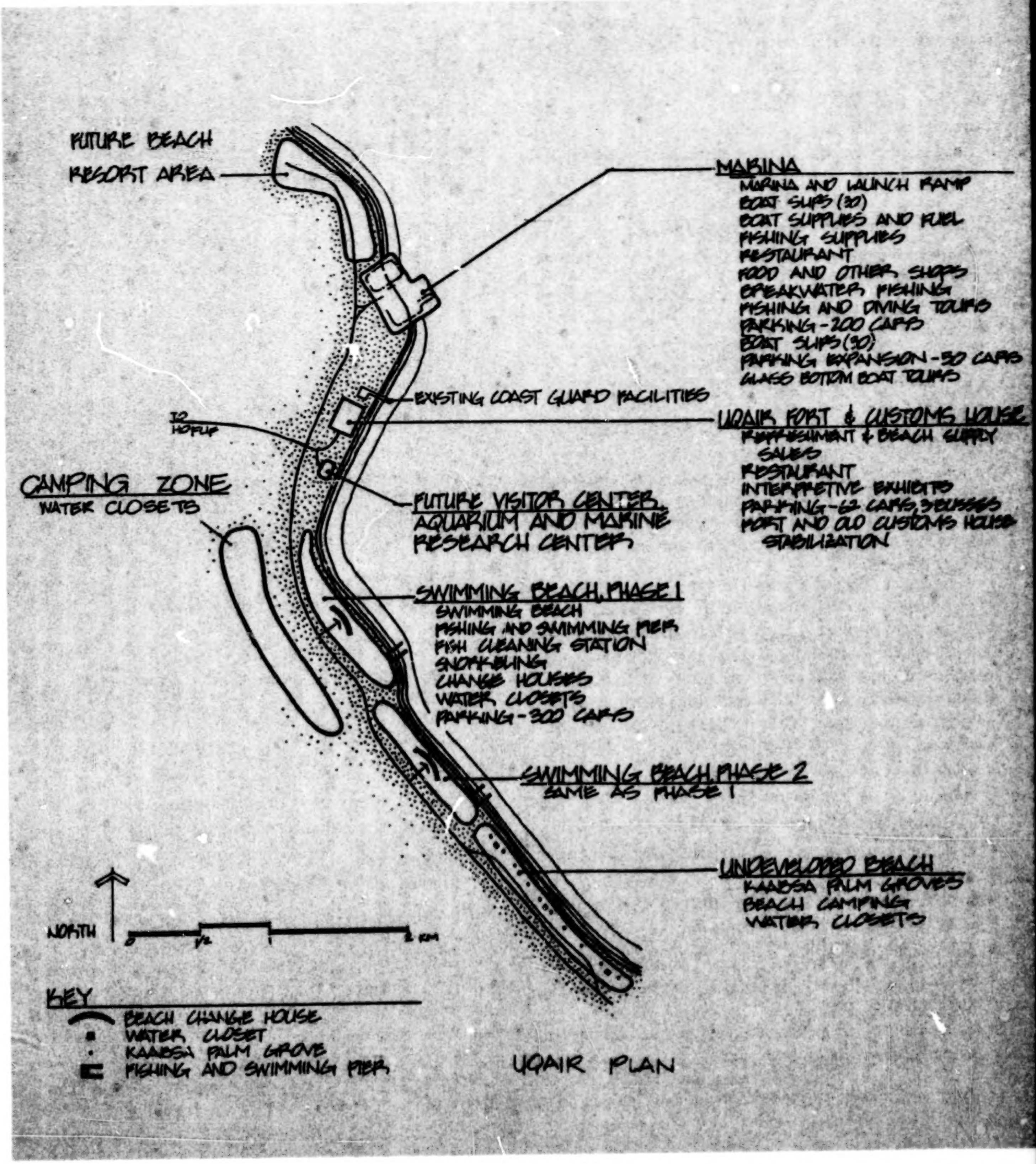
Access: Uqair and contiguous beaches are easily reached over a new, paved road which has its western terminus on the Dammam-Hofuf highway roughly 25 kilometers north of Hofuf. The distance from the highway junction to Uqair is about 75 kilometers. Access to the beaches south of the village is reasonably good. Numerous hardened dirt trails traverse the beach, and a well-graded, unpaved road extends along the base of the dunes south to the second coast guard station and beyond.

Approximate Size: The area being considered for recreation development is approximately one kilometer wide, from the waterline westward to beyond the dune ridge, and extends roughly seven kilometers along the shoreline south of the village. Further development would take place immediately north of the village and coast guard station. The total area consists of about 700 hectares. However, the undeveloped beaches extend more than 20 kilometers in both directions from the village and are potential future development areas.



Existing Development and Use: The small village contains remains of a large 16th century Ottoman fort and 20th century customs facilities, a small concrete structure, a relatively new coast guard station and Amir's residence, and numerous small wooden structures north and northwest of the fort. The beach areas and pockets of vegetation receive moderately heavy day use and some camping, especially during weekends. Fishing, especially from the landing behind the customs house, is a popular activity. Some boating and snorkeling also take place.

Proposed Development: Prior to any development at Uqair, the beach, shoreline, and swimming area should be thoroughly cleaned and cleared of accumulated litter and debris. A regular maintenance program should be established to ensure that the beaches are kept clean.


FUTURE BEACH
RESORT AREA
MARINA
MARINA AND LAUNCH RAMP
BOAT SLIPS (30)
BOAT SUPPLIES AND FUEL
FISHING SUPPLIES
RESTAURANT
FOOD AND OTHER SHOPS
BREAKWATER FISHING
FISHING AND DIVING TOURS
PARKING - 200 CARS
BOAT SLIPS (30)
PARKING EXPANSION - 50 CARS
GLASS BOTTOM BOAT TOURS
EXISTING COAST GUARD FACILITIES
TO HOFUF
UQAIR FORT & CUSTOMS HOUSE
REFRESHMENT & BEACH SUPPLY
SALES
RESTAURANT
INTERPRETIVE EXHIBITS
PARKING - 62 CARS, 3 BUSSES
FORT AND OLD CUSTOMS HOUSE
STABILIZATION
CAMPING ZONE
WATER CLOSETS
FUTURE VISITOR CENTER,
AQUARIUM AND MARINE
RESEARCH CENTER
SWIMMING BEACH, PHASE 1
SWIMMING BEACH
FISHING AND SWIMMING PIER
FISH CLEANING STATION
SNORKELING
CHANGE HOUSES
WATER CLOSETS
PARKING - 300 CARS
SWIMMING BEACH, PHASE 2
SAME AS PHASE 1
UNDEVELOPED BEACH
KAABSA PALM GROVES
BEACH CAMPING
WATER CLOSETS
NORTH
0
1/2
1
2 KM
KEY
BEACH CHANGE HOUSE
WATER CLOSET
KAABSA PALM GROVE
FISHING AND SWIMMING PIER
UQAIR PLAN

It is proposed that development take place in two phases: Phase I would include four components: (1) developed swimming beach; (2) dispersed recreational facilities; (3) Ottoman fort and customs house; and (4) marina.

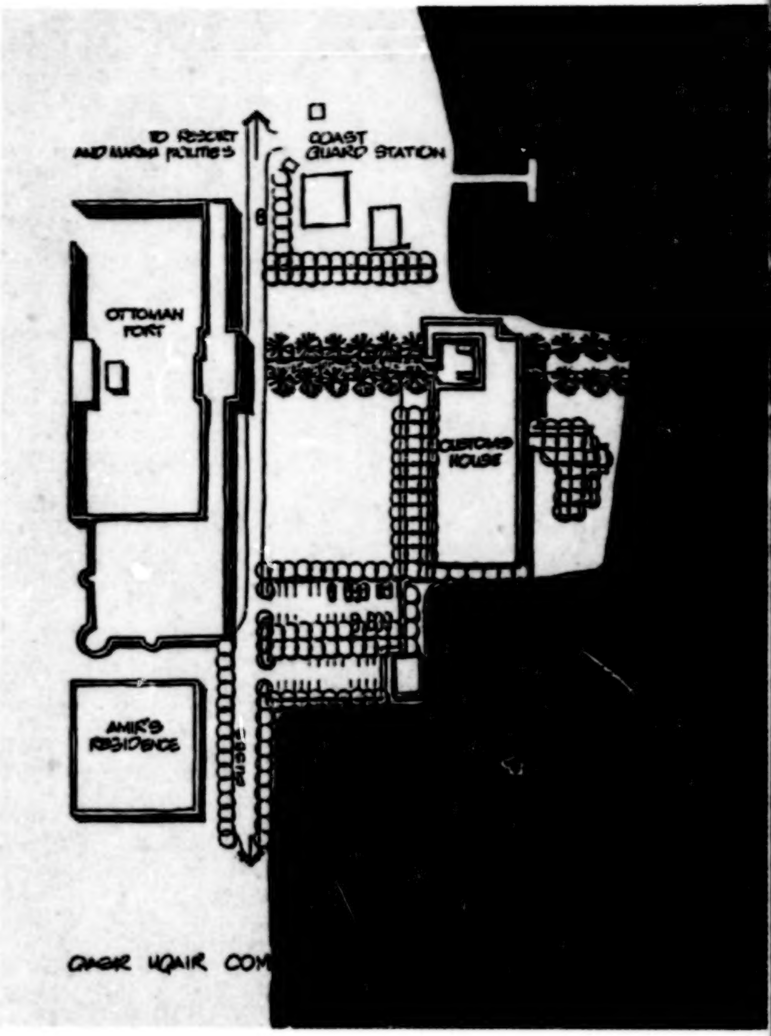
(1) *Developed Swimming Beach:* The proposed swimming beach development extends one kilometer south of the fort/customs house complex. Development of this area would include:

- a two-pronged pier/breakwater with interior swimming area screened against sharks and seasnakes;
- fishing facilities located on the piers, for fishing outside the swimming area;
- changing/dressing facilities;
- water closets and water source;
- concession facilities for food, fishing supplies, etc.
- parking area for 300 cars.

(2) *Dispersed Recreational Facilities:* A series of day use/camping sites would be developed south of the developed swimming beach area. Approximately one-third of the sites would be developed with shade, water, rest rooms, and parking. The rest of the sites would be undeveloped, scattered among the trees. A parcourse exercise trail would wind through the area.

(3) *Ottoman Fort and Customs House:* Stabilization and renovation are required to preserve these historic structures and make them available for adaptive use. Wayside exhibits would focus on the long and varied history of the area. The customs house would provide a central location for information services, restaurant, and concession facilities. Development would include:

- stabilization of the fort;
- renovation of the customs house for adaptive use as restaurant and park offices;
- shaded patio next to the customs house overlooking the Gulf;
- conversion of the small concrete structure south of the customs house into a concession facility;
- park maintenance facility, in the vicinity of the fort;
- 60 car parking area serving the restaurant and concession building; and
- selective planting which would highlight the buildings and screen the renovated customs house.

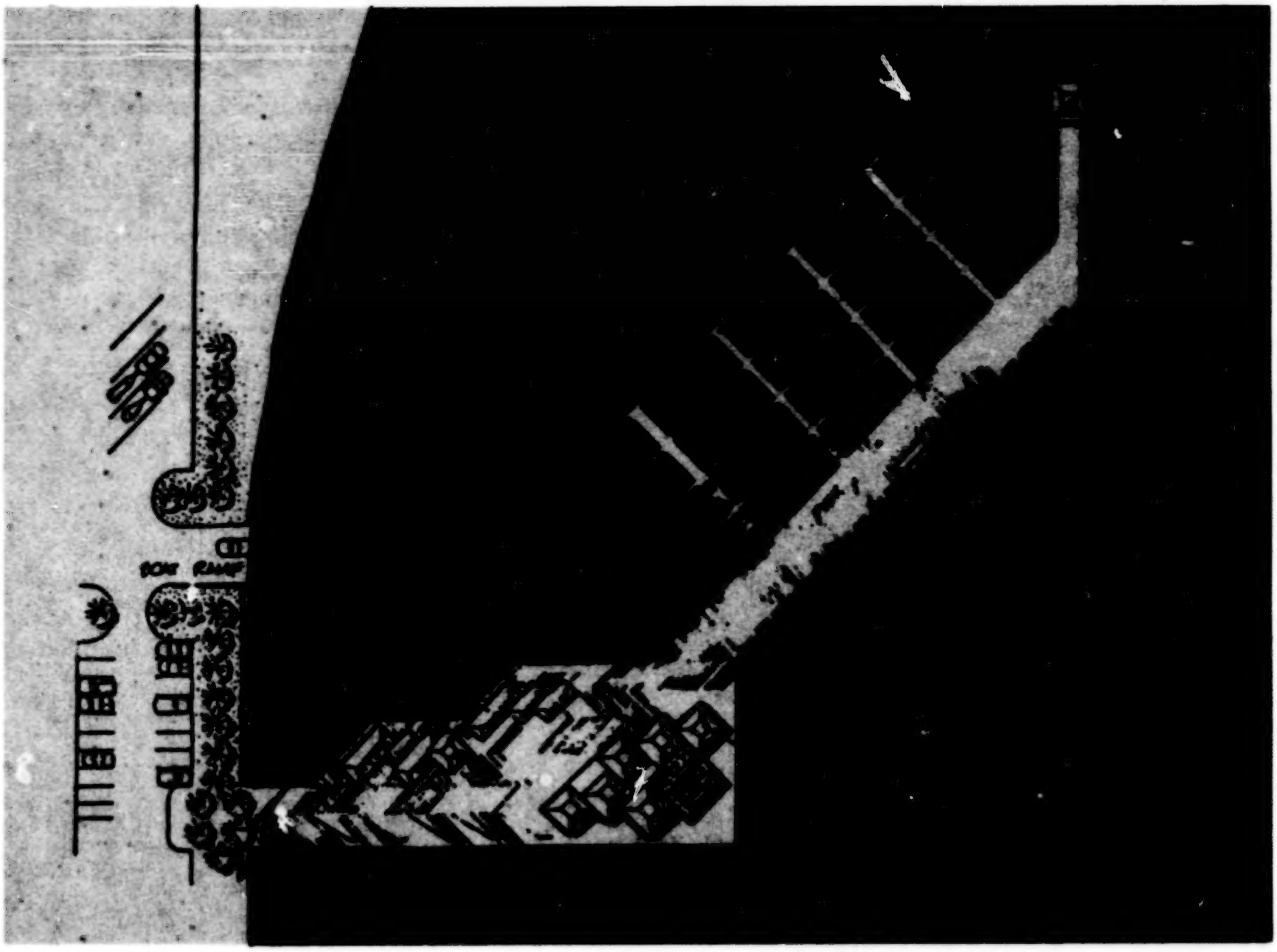


(4) *Marina:* The marina complex would be developed north of the fort-customs house complex. Initial development would include:

- a boat launch ramp and slips for 30 boats;
- a restaurant (if visitation is sufficient to support it);
- concessions for gasoline, boat rental, and fishing supplies; and
- a parking area for 100 cars.

Future development at the marina could significantly enlarge the docking capacity and might include a concession for selling and servicing boats. The Arabian Gulf offers excellent opportunities for sailing, fishing, and windsurfing. Future development should allow for as much water-related activity as possible.

Future stages of development (Phase II) would entail enlargement of the first phase. Use and resultant demand should be major factors in the timing of subsequent development. Future beach resort development may be a spinoff of demand created by the initial development. It is anticipated



that the private sector would invest in hotels, cottages, and restaurants, eventually developing a complete destination resort area.

Experimental, prototype facilities for desalinization and sewage treatment, using solar power, could be developed to provide long term solutions to the problems of fresh water supply, power generation, and sewage disposal. These facilities, developed through existing Kingdom efforts and through the nearby University of Petroleum and Minerals could serve as models for recreation developments and villages where such services would be expensive and/or difficult to obtain from existing power grids and water systems.

Interpretation: On-site interpretation would be provided by wayside exhibits. Exhibits would be provided to interpret the historic structures: fort, customs offices, and watchtower. Other exhibits would recreate historic scenes: the lost city of Gerrha, pilgrims making the Hajj, the white donkeys of al Hassa carrying goods from the port to Hofuf, dhows laden with goods lining an ancient pier, Turkish soldiers on duty at the fort, and dignitaries gathered to negotiate the Protocol of Uqair. The number of such exhibits is estimated at ten.

Park orientation map panels would be displayed at the courtyard of the fort/customs office complex and at the proposed marina. Park folders would be available from concessioners and at the Uqair District office of the park.

Park concessioners would also be encouraged to provide excursion and glass-bottom boat tours and guided snorkel tours.

In the future, after visitation levels and patterns have evolved, park management may wish to consider a visitor center/aquarium facility.

Development Cost Estimate: 22,959,900 SR*

*does not include stabilization of the fort or renovation of the customs house.

Q'asr Kilabiyah

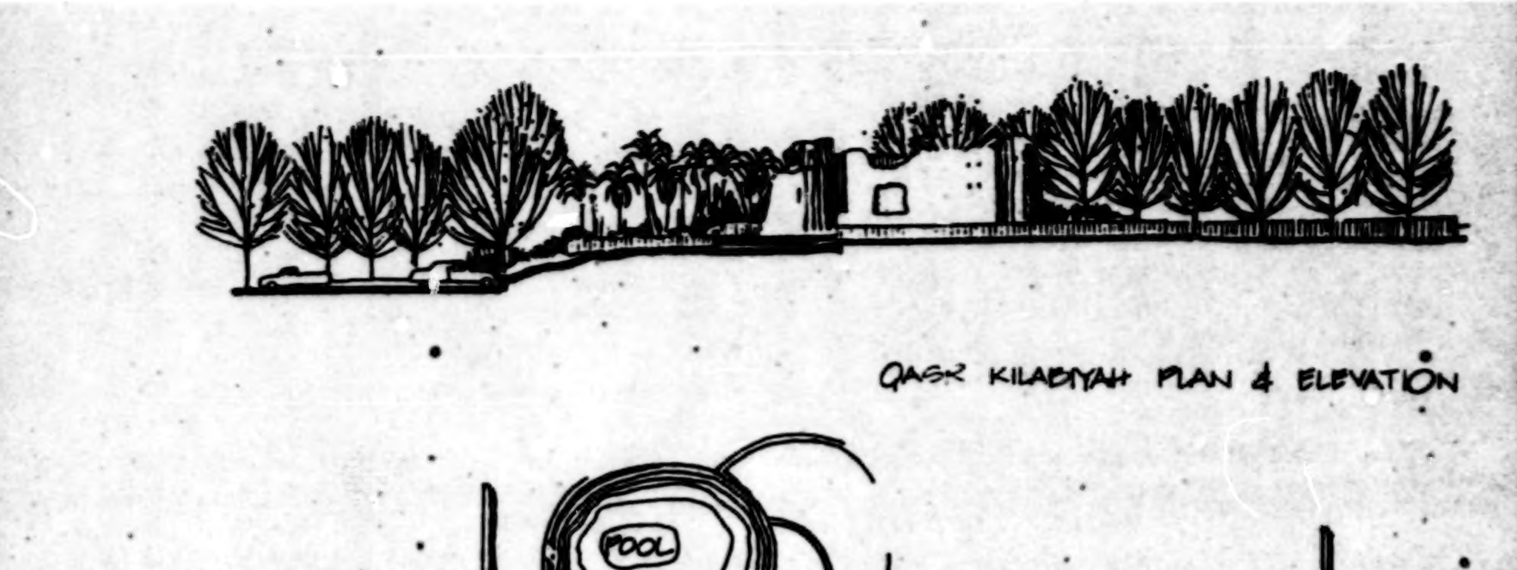
Site Description: The site consists of the vestige of an Ottoman fort developed to protect villagers and to guard an adjacent spring-fed pool, a few palm trees, and several very large tamarisks. The fort structure has eroded over time and requires stabilization or, possibly, rehabilitation. Because of its proximity to a number of other sites proposed for development in the national recreation park, the current level of use that it receives, and because it represents a recent period of history in al Hassa, it is an important element of the overall park development proposal.

Administration: Department of Antiquities and Museums, Ministry of Education.

Access: Located in the northwestern corner of the village of Kilabiyah, roughly 15 kilometers northeast of Hofuf, 2 kilometers south of Jawatha Mosque, and 1.5 kilometers west of Mashatal al Shapane Park. While the village is accessible by high quality asphalt roads, access to the fort is unpaved and difficult to find.

Approximate Size: 3 hectares.

Existing Facilities and Use: There are no recreational facilities other than the fort structure and spring-fed pool. The pool is used for swimming, camel watering, and car washing. The site receives its heaviest use from residents of the nearby village of Kilabiyah.



Proposed Development: It is proposed that a number of improvements be made to this site including:

- stabilization of the fort structure, with restoration a possible long term goal;
- landscaping the knoll on which the fort is located, and providing access by stairs to help arrest erosion;
- stabilizing the sides of the pool;
- constructioin of a paved access road and parking lot to facilitate visitor access;
- development of rest rooms and a sitting area with benches and trees.

Interpretation: Two or more wayside exhibits would detail the fort's functions, place the structure in the historical context of the Ottoman occupation, and describe the expulsion of the Turks from al Hassa in 1913.

The park orientation map panel would be placed at the parking area.

Development Cost Estimate: 879,850 SR

Jebel al Q'arah

Site Description: The caves of al Q'arah are remnants of an earlier marine environment formed by the action of breaking waves. The caves now provide an interesting recreational and aesthetic experience. Bus tours, sometimes in conjunction with trips to the Thursday market in Hofuf, regularly stop here and on the western side of the jebel where artisans make and sell traditional earthenware vessels. The natural environment of the caves and the traditional potters are the focus of activity at Jebel al Q'arah. Recent development has greatly improved visitor services. Proposed improvements would further enhance the site and provide interpretation.

Administration: Ministry of Municipalities and Rural Affairs.

Access: 14 kilometers east of Hofuf by way of the Hofuf Hulaylah road, and then along the road to Q'arah.

Approximate Size: 25 hectares.

Existing Facilities and Use: Recent development on the eastern side of the jebel includes: an asphalt parking area for cars and buses; rest rooms; a children's play area; concession facilities; and, a paved, lighted cave trail. Some visitors tend to spend a short time in the cave, walking along the trail or eating a picnic lunch or supper. Others simply escape to the cool interior of the caves to avoid the midday heat. The children's playground equipment is used in evenings when sun and heat permit.

Proposed Development: It is proposed that minor improvements be made at Jebel al Q'arah including:

- installation of a shade structure over the children's play area. The area is currently exposed to constant direct sun, and the steel play equipment becomes too hot to use;
- planting of shrubs around the parking area and along the entrance to the caves to soften the landscape and provide shade for cars;
- installation of additional benches at the cave's entrance and along its trail. Existing benches are well-used and enjoyed by visitors.
- development of a short, self-guiding trail to an overlook on top of Jebel al Q'arah. The top of the jebel is one of the highest points in the oases and provides views of the surrounding landscape, including date farms, irrigation works, and neighboring communities;
- development of a loop, hiking/biking trail at the base of the jebel. A hiking/biking trail is proposed to link several sites in the central district. The Jebel al Q'arah loop would be an integral portion of this larger system. This loop would be about six kilometers long; and,
- eventual installation of a cave lighting system that blends more naturally and unobtrusively into the cave.

Interpretation: A wayside exhibit near the entrance to the caves would interpret their geologic origin. A second, at the stairs above the parking lot, would interpret the vast date plantations which surround the jebel.

Three or four small wayside exhibits would provide additional interpretation of geology and the vistas along a proposed trail to the summit.

The park orientation map panel would be displayed near the concessions building. The park folder would be available at the concessions building.

Development Cost Estimate: 398,300 SR

Al Hassa Hiking / Biking Trail

Hiking/biking trails are important recreation facilities in parks. They provide visitors with a facility for experiencing park resources at an intimate level in a relaxed manner, are good forms of physical exercise, and often serve to link together a variety of recreation facilities and areas.

Proposed Development: A major trail is proposed for the central district of the park. It would connect Sand Stabilization, Jawatha Mosque, Q'asr Kilabiyah, Mashatal al Shapane Park, the caves of Jebel al Q'arah and eventually, the summit of Jebel Buraiqa. This trail would take the visitor through a variety of areas, including dunes and desert, palm groves, several villages, caves and oases, and would be accessible from a number of different points. The sights and sounds along the way would provide enjoyable and interesting park experiences.

Most of the trail would run parallel to existing roads and canals. The northern section connecting Sand Stabilization and Jawatha Mosque would pass through an open, undeveloped area. Underpasses or overpasses should be developed where the trail crosses roads or canals. Rest stops with benches would be provided at shaded points along the trail. The trail would pass close to water closets and water sources at various sites and to the concession facility at Mashatal Park. Wayside exhibits would be developed along the trail to provide information about the features and sites along it. The trail would have loops providing the user with opportunities to take a one day 15-20 kilometer hike, or an overnight 30 kilometer trip.

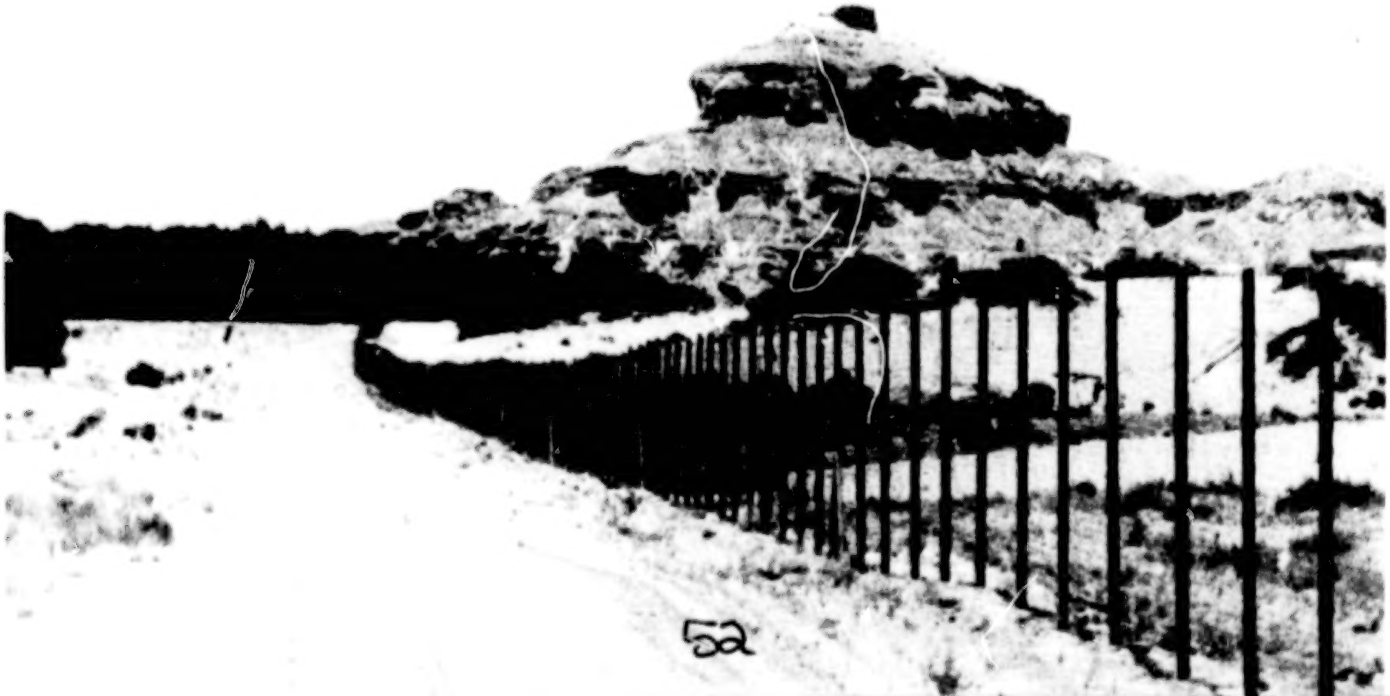
The trail would be an important safety feature for the area. The developed park sites are expected to attract many people, thus substantially increasing vehicular traffic in the area where there are many villages with significant numbers of small children. Usually the streets and roads are the only areas available for bike and play. For children and other pedestrians, the trail and feeder routes would provide safer access to and from park sites as well as provide children with an opportunity to bike away from busy streets and to take relatively long rides.

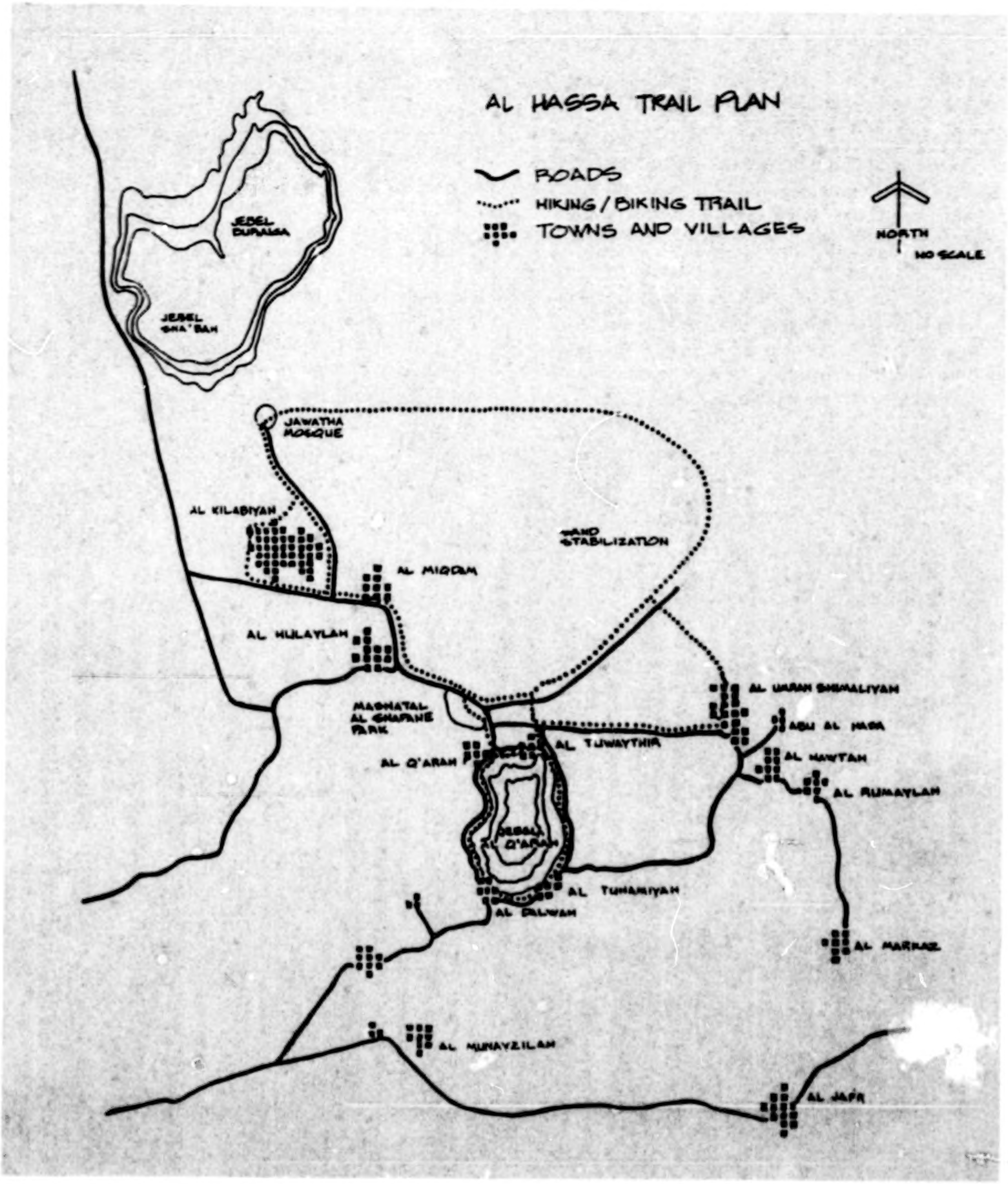
Interpretation: A free folder would be prepared to provide visitors with a map of the al Hassa trail system. The folder would be available at the Sand Stabilization Visitor Center and at concessions buildings at Jebel al Q'arah and Mashatal al Shapane Park.

A similar map with a "You are here" symbol would be produced for small wayside exhibit panels to be located at approximately five kilometer intervals along the trail and at major intersections and park sites. Approximately ten such exhibits would be needed.

Two or three wayside exhibits would interpret features along the trail such as springs and Jebel Buraiqa.

Development Costs: 4,097,100 SR




AL HASSA TRAIL PLAN
ROADS
HIKING / BIKING TRAIL
TOWNS AND VILLAGES
NORTH
NO SCALE
JEBEL DURAIGA
JEBEL SHA'BAH
JAWATHA MOSQUE
AL KILABIYAH
SAND STABILIZATION
AL MIQDAM
AL HULAYLAH
MASHATAL AL GHAFANE PARK
AL UMRAN SHEMALIYAH
ABU AL HASA
AL TUWAYTHIR
AL Q'ARAH
AL HAWTAH
AL RUMAYLAH
JEBAL AL Q'ARAH
AL TUHAMIYAH
AL DALWAH
AL MARKAZ
AL MUNAYZILAH
AL JAFR

Jebel Arba

Site Description: Jebel Arba is a cluster of four sandstone erosional buttes rising above an expanse of sparsely vegetated desert and a sabkhah. The buttes rise over 30 meters above the desert surface. They are a striking landmark along the Salwah/Qatar Road and signal one's approach to al Hassa.

Administration: Ministry of Agriculture and Water.

Access: Located 20 kilometers south and east of Hofuf, one kilometer north of the Salwah/Qatar Road. A hardened gravel road lined by small palm trees provides direct access to the base of Jebel Arba.

Approximate Size: seven hectares, including access road.

Existing Facilities: A hardened gravel parking lot is presently located at the southwestern corner of the site. Several off-road vehicle trails crisscross the surrounding desert. There are no recreational facilities developed at the site.

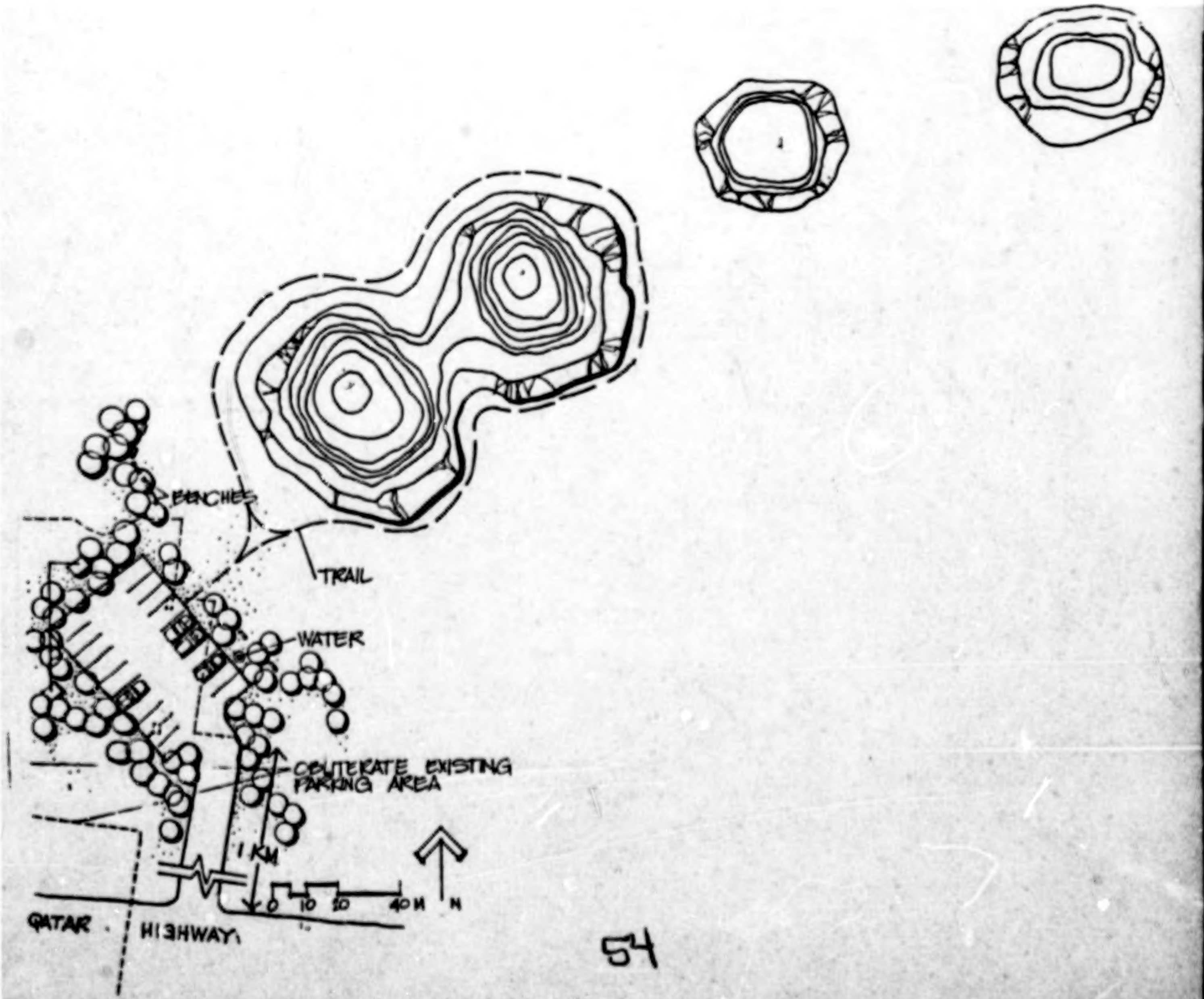
Proposed Development: It is proposed that opportunities for recreation, observation, and relaxation be provided at Jebel Arba through development of the following facilities:

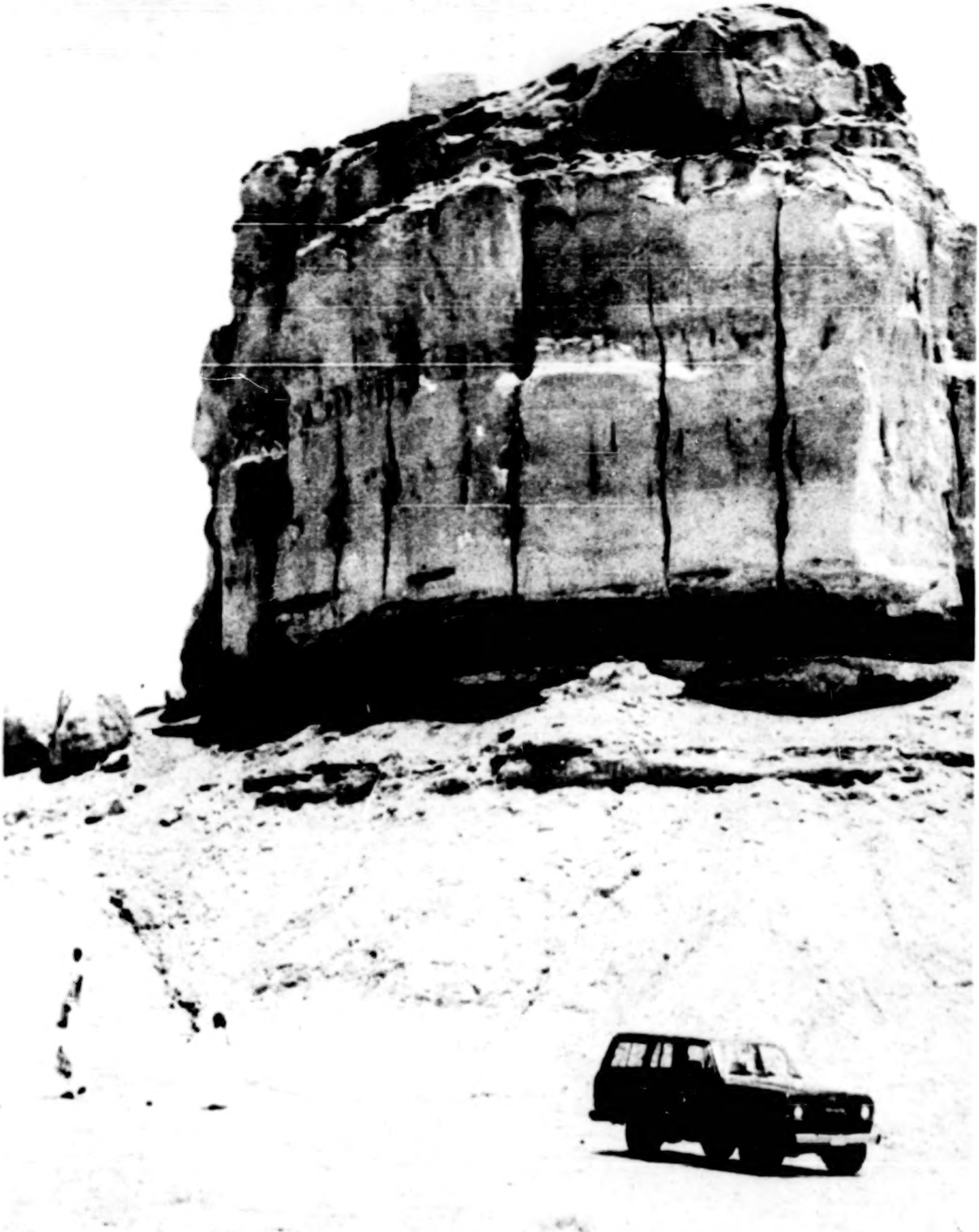
- relocation and paving of the parking area, and paving the access road;
- a hardened trail encircling the base of the sandstone formations;
- planting trees and shrubs in the clusters around the parking area;
- sitting benches in the vicinity of the parking area;
- a well and rest rooms for visitor use.

Interpretation: A single wayside exhibit would interpret Jebel Arba as a northern edge of the Rub' al Khali.

The park orientation map panel would be mounted at the entrance to the site on the Salwah/Qatar Road.

Development Cost Estimate: 661,900 SR





Q'asr Waziyah

Site Description: Q'asr Waziyah is another structure dating from the 18th century Ottoman occupation. It is somewhat isolated from other park sites, but is in a better state of preservation than Q'asr Kilabiyah. The two forts served similar functions—to maintain Ottoman control over the local area and to protect village settlers against raids. It is representative of this relatively recent historical period in al Hassa and provides opportunities for interpretation, historical research, and education. The Department of Antiquities and Museums is undertaking a reconstruction/stabilization project for the fort structure and intends to provide improved access and parking.

Inclusion of the site in the recreation park would expose park visitors to the valuable work of the Department in preserving the cultural heritage of Saudi Arabia.

Administration: Department of Antiquities and Museums, Ministry of Education

Access: Located in the southeastern corner of the village of Waziyah, 16 kilometers north of Hofuf along the Dammam Highway, and 2 kilometers east on improved village roads.

Approximate Size: 3 hectares

Existing Facilities: Q'asr Waziyah is in a better state of preservation than Q'asr Kilabiyah, with its walls and turrets reasonably intact. No recreational facilities are currently on the site, although the Department of Antiquities and Museums is undertaking a 270,000 SR reconstruction/stabilization project of the fort structure, and plans to provide improved access and parking.

Proposed Development: The following improvements are proposed:

- installation of rest rooms;
- planting trees and shrubs around the parking area; and
- providing water for visitor use.

These amenities would complement and capitalize on the efforts of the Department of Antiquities and Museums to restore the fort structure.

Interpretation: A single wayside exhibit would explain the fort's function and provide some information about the reconstrution/stabilization project being undertaken by the Department of Antiquities and Museums.

The park orientation map panel would be mounted at the parking area.

Development Cost Estimate: 338,650 SR

Historic Caravan Route

The historic caravan route, running between the old port of al Uqair on the Arabian Gulf and the village of Jishshah at the eastern edge of al Hassa, provides an excellent opportunity for adventurous park visitors to experience the rigors of a desert crossing (proposed route outlined on General Plan). Sites and sounds of bygone days—pilgrims traveling from the east to make the Hajj, traders carrying their wares to and from al Hassa, desert camping in the wild—can be recreated.

Two very different approaches can be used for the caravan trip, each using the services of private concessioners. One option would capture the essence of old Arabia as visitors would rent camels or donkeys and set off on a two-day desert trip, making camp at a point midway—perhaps at an old fort or oasis—between Uqair and Jishshah. Food, supplies, camels, and donkeys could be provided by the concessioner.

A second option would be a one or two day, four wheel-drive trip along the caravan route, with the concessioner again providing supplies as outlined above, and possibly the vehicles.

If both options are considered for use, they should be routed along separate trails and should not be run at the same time. In this way, the two very different modes of travel would not impinge on one another.

Interpretation: In addition to the exhibit proposed for al Uqair, two additional wayside exhibits would be provided interpreting the historic route. One would be located at a roadside pullout to be constructed where the bypass road to the east of al Hassa will cross the route. The other would be located at the village of Jishshah.

Development Cost Estimate: 25,400 SR (for interpretive wayside exhibits only. Any development costs would be borne by the concessioner).

Q'asr Ibrahim

Site Description: Q'asr Ibrahim is a 16th century fortification that served as headquarters for the regional garrison of the Ottoman Empire. In addition to housing Ottoman soldiers, it served as a prison. The fort, with its palace and large, domed mosque, is one of the most significant historical structures in al Hassa. After Abdul Aziz ibn Saud expelled the Turks from al Hassa, the fort was used as a police station before being abandoned during the 1940s.

Administration: Department of Antiquities and Museums, Ministry of Education.

Access: Located in Fariq al Kut in downtown Hofuf.

Approximate Size: four hectares

Existing Facilities: Q'asr Ibrahim is presently closed to the general public, although tours may be arranged through the Department of Antiquities and Museums. The Department is conducting a documentation study of the fort's resources which will serve as a basis for future restoration efforts. Some reconstruction and stabilization of the fort's exterior walls has been completed, but much of its interior, including the mosque and palace, is in need of immediate stabilization, with reconstruction a desirable long term goal.

Proposed Development: No specific recreational development is proposed for Q'asr Ibrahim at the present time. As the Department of Antiquities and Museums proceeds with its reconstruction/stabilization programs, subsequent recreational development and use (such as tours and educational programs) which is consistent with the site's historical character, may be considered.

Interpretation: A single wayside exhibit, providing details of Abdul Aziz ibn Saud's expulsion of the Turks from al Hassa is proposed. It would be located outside the fort's entrance.

The park orientation map panel should be displayed in the same location.

In the future, if interest in the fort increases, park management may wish to consider additional wayside exhibits, the publication of a small folder providing information and history, and/or scheduled guided tours.

Development Cost Estimate: 25,400 SR

South Evaporation Sea

Site Description: The presence of a large body of water in an otherwise arid environment makes the South Evaporation Sea an important regional feature. The sea is fed by irrigation runoff from the eastern oases of al Hassa and effluent from the Hofuf waste disposal system. The water level of the sea fluctuates, with the highest levels occurring during winter. The size of the sea is expected to grow as the Hassa Irrigation and Drainage Authority diverts more water to this area. A large sand dune dominates the site and is surrounded by the sea on three sides. A relatively natural marsh/lake ecosystem has begun to develop and serves as an important habitat for resident and migratory bird species and other animals.

Administration: Hassa Irrigation and Drainage Authority, Ministry of Agriculture and Water.

Access: Located approximately 27 kilometers northeast of Hofuf, access is currently limited to four-wheel drive and off-road vehicles. Access will improve as asphalt roads within the Hassa Irrigation and Drainage Authority D-2 drainage area and the proposed Hofuf bypass are completed.

Approximate Size: The South Evaporation Sea and contiguous land occupy approximately 22,500 hectares.

Existing Facilities and Use: There are no recreational facilities presently located at the South Evaporation Sea. The area is used for bird watching, hunting, and four-wheel drive activity in the dunes and surrounding areas.

Proposed Development: Initially, it is proposed that the resources of the sea be held in reserve. Substantial recreational development would be undertaken here when recreational use patterns and demand for specific types of facilities can be discerned and when the water quality has improved. Certain recreation activities not requiring development or only minimal development should be considered and/or encouraged, including:

- hunting along the shoreline in prescribed time and spatial zones;
- birdwatching and nature study.

Interpretation: Interpretation facilities are not recommended for this site at the present time.

Roadside Rests

It is proposed that a study be undertaken to assess the feasibility of developing a system of roadside rests in the al Hassa/Uqair National Recreation Park study area. These rest areas would provide drivers with facilities for relaxation, and could provide opportunities for disseminating information on the national recreation park and its resources.

Roadside pullouts and rest areas provide excellent opportunities for interpreting visible features. As a part of the overall planning and design of interpretive facilities for the national recreation park, consideration may be given to the following areas or themes for roadside rests:

- Uqair Road: to interpret the mass movement of sand from the north and the resulting threat to the al Hassa oases; to identify different kinds of sand dunes and the reasons for their shapes; and, to identify this area as a northern extension of the Rub' al Khali;
- Irrigation and Sand Stabilization Areas: to identify and explain the use of canals, drainage ditches, sand stabilization fences, and tree plantings, and to discuss the aquifers as sources of water for the springs;
- Salwah/Qatar Road: to interpret the Rub' al Khali which extends 800 kilometers to the south;
- Antiquities: to call attention to an interpret the sites of ancient developments, such as the mosque remains along the Uqair Road.

Proposed Development: It is proposed that about ten wayside exhibit panels be erected at existing sites as described above. Further development might be proposed following the recommended study.

Development Cost Estimate: 127,000 SR

Additional Study and Design Needs

While this study has brought together conceptual and detailed information relevant to the planning and development of al Hassa/Uqair National Recreation Park, additional information and actions are necessary for subsequent design, development, and management. These include:

- detailed topographic maps and high quality aerial photographs of the study area, with photo coverage during all seasons of the year;
- a study to delineate specific boundaries for the sites proposed for development, verifying the ownership data obtained in preparing the conceptual plan;
- undertake an inventory of indigenous flora and fauna, and commission studies to examine the feasibility of reintroducing native species to the park;
- collect specific hydrologic data for evaporation sea areas, with particular attention to elevation fluctuations through the year and anticipated long term growth rates;
- update current information on regional transportation plans as development proceeds so these projects can be integrated into plans for recreational development.

Additional future considerations should include:

- monitor and assess visitation trends to assist transportation planners in developing future transportation corridors.
- examine alternatives and develop park policies concerning the role of private enterprise in providing visitor services through concession arrangements, and investigate the possibility of the private sector providing recreation opportunities to supplement those offered in the national recreation park. For example, campgrounds, bicycles, hang gliders, and windsurfers are types of facilities and services that could be offered.
- conduct indepth historical studies for each of the sites recommended for development.
- because of the many interests and activities involved in the proposed park, consideration should be given to establishing an interagency coordinating group to provide consultation during preparation of final architectural and design plans.
- identify additional sites for possible future recreational development to complement those proposed herein.

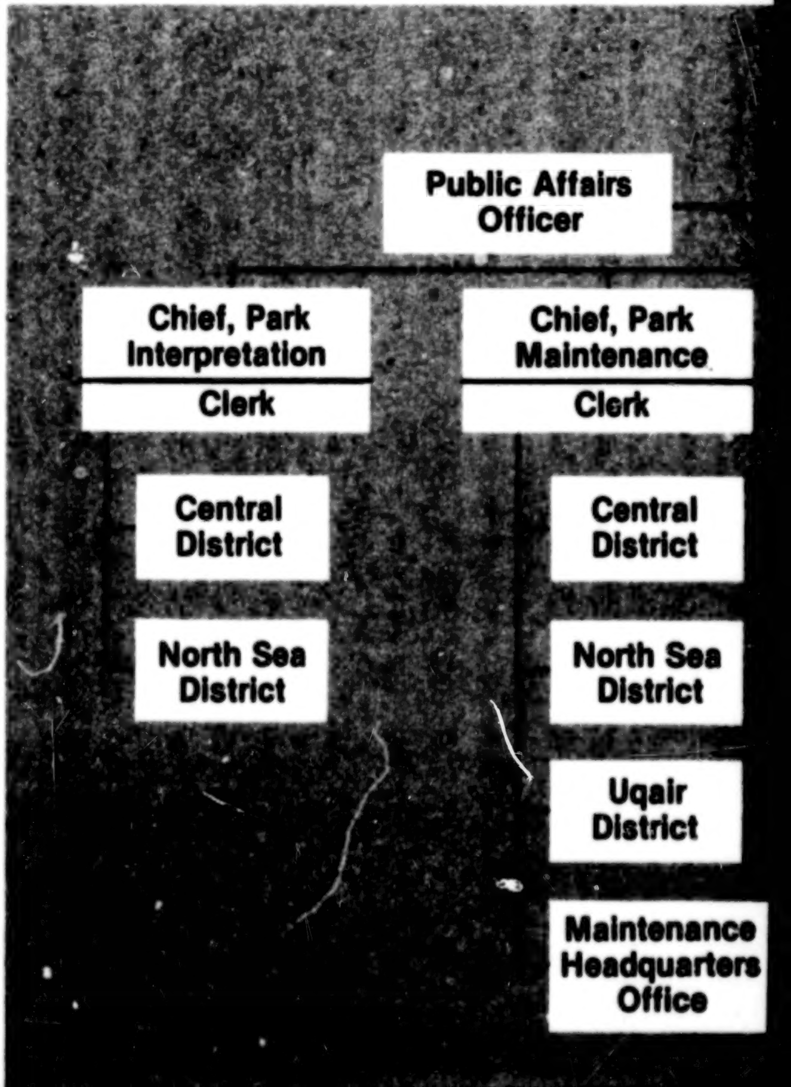
Management and Staffing

As outlined in the accompanying chart, it is proposed that a park manager, assisted directly by a management assistant, public affairs officer, and secretary, manage the al Hassa/Uqair National Recreation Park. Five professional managers with expertise and responsibilities in the areas of interpretation, maintenance, resources management, administration, and professional services would report to the park manager. Proposed functions and the estimated number of staff associated with each office are as follows:

Park Manager: (2, including secretary) responsible for overall management and operation of the park, including interpretation, maintenance, resources management and operations, administration, professional services and public affairs;

Management Assistant: (1) Responsible for professional assistance to the park manager in administering the park's facilities and programs.

Public Affairs Officer: (2, including secretary) responsible for preparing and disseminating information and related materials on the park's resources and programs to interested agencies, organizations, and individuals; undertakes community education programs;



Chief, Park Interpretation: (10) responsible for developing and implementing the overall interpretive program for the park, including visitor centers, exhibits, museums, zoos, and audiovisual and printed materials;

Chief, Park Maintenance: (55) responsible for developing and implementing the overall maintenance program for the park, including routine clean up and maintenance operations, preventive maintenance to structures and facilities, road and utility construction and repair; supervises maintenance employees at Central, Uqair, and North Sea Districts, and the operations of the maintenance headquarters office that provides park wide service.

Chief, Resources Management and Operations: (20) responsible for developing and implementing programs for natural and cultural resources management in the park, including natural history studies, inventories and surveys, re-introduction of native species, scientific research, and archeological and historical restoration and stabilization projects;

Chief, Professional Services: (10) responsible for providing professional staff support to the park manager and other line officers, including planning and design, graphics, audiovisual materials, and relations with communities and other park professionals;

Chief Administration: (15) responsible for administrative support for park management and operations, including personnel, budget, finance, contracting, and the master file system.

Total number of park employees: 120

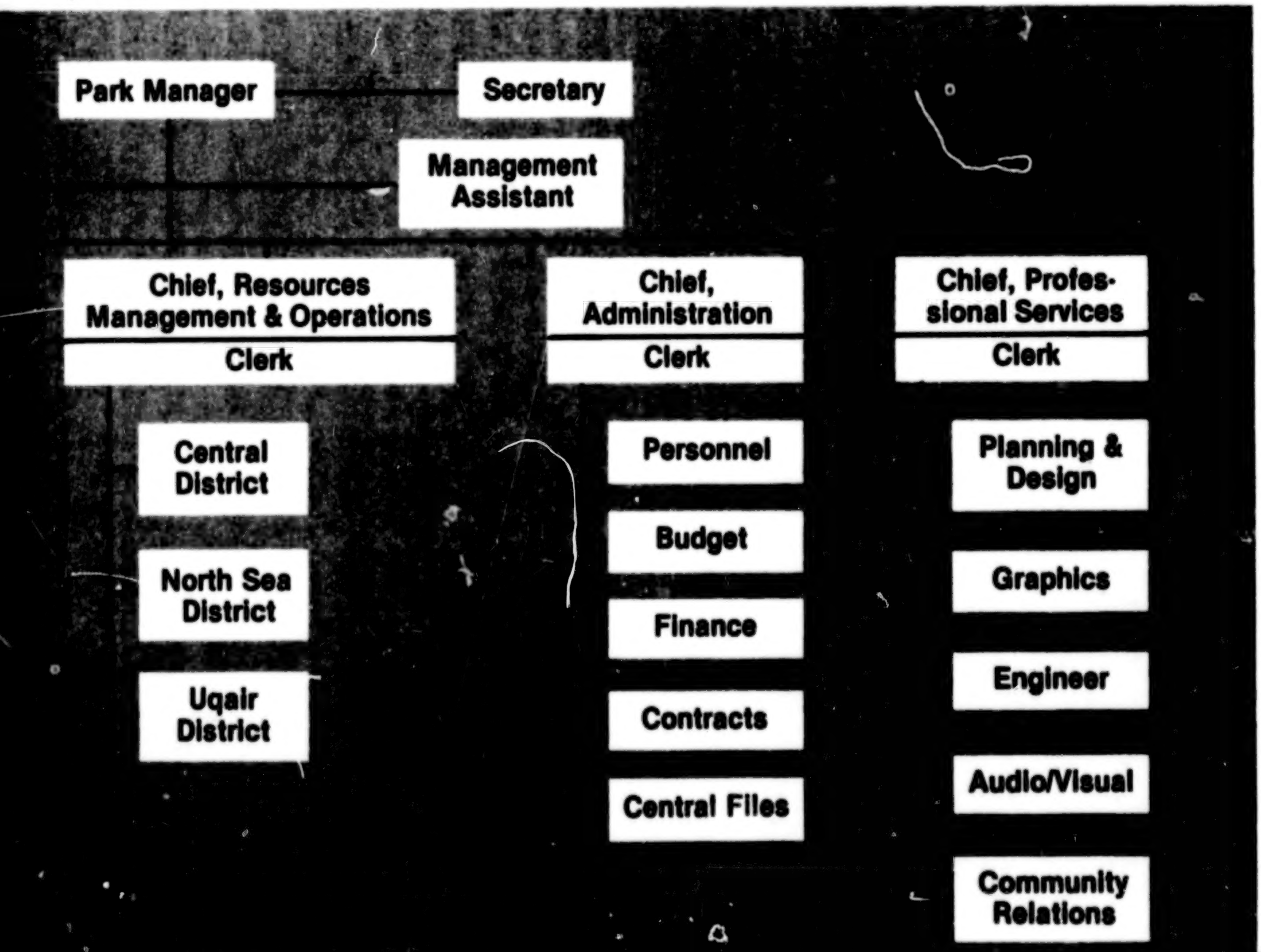
To ease administration of the National Recreation Park, it is proposed that the administrative sites be arranged into three management districts, within which permanent mantenance facilities would be developed and to which personnel would be assigned. It is proposed that these be:

Central District: Sand Stabilization, Mashatal al Shapane Park, Jebel al Q'arah, Q'asr Kilabiyah, Jawatha Mosque, South Evaporation Sea, Jebel Arba, and Q'asr Ibrahim;

North Sea District: North Evaporation Sea, Q'asr Waziyah;

Uqair District: Uqair.

In addition to these three districts, it is proposed that a maintenance headquarters offfice be established within Sand Stabilization to provide maintenance service to equipment and facilities throughout the park.



Appendix

Detailed construction cost estimates

The following cost estimates were developed from several sources. Most building, utility, and roadway unit costs were contributed by the Deputy Director of Rashid al Omran Contractors in Hofuf. Marine related construction costs for al Uqair were obtained from the U.S. Army Corps of Engineers. Miscellaneous costs for such items as landscaping, benches, children's equipment, etc. were developed from the unit costs for similar items at Asir National Park. Reductions or increases were applied to these items depending upon the nature of the construction, the item, the requirements of the al Hassa area and professional judgment.

Specific notes on cost:

Water

The water service proposed throughout this plan provides only for service water, i.e. water for rest rooms, pools, and general family use. It does not attempt to include potable water. Most patrons of these recreational facilities would come for a day or overnight and normally would bring their own bottled drinking water. Also, since municipalities keep general use water separate, this practice will be compatible.

Sewage

In these estimates the sewage collection systems are assumed to consist of rest rooms, sewer lines, septic tanks, and drain fields. An alternate consideration would be individual, aerobic bacteria action type toilets—also known as composting privies. No costs for these units are provided here, but it is probable they could be economically competitive. They might be especially desirable in portions of the study area where there would be long expensive runs of collector lines or where percolation characteristics demand an alternative to leach fields. Various companies market this type of privy.

Electrical

Costs for electrical work within buildings were considered to be included within the cost estimate for the corresponding structure. Where power is required to be brought to a site, a cost of cable-in-the-ground has been itemized. Most probably, during much of the development phase, diesel or gasoline generators will provide any required current. Most facilities in the study area are daytime oriented and lighting is not critical.

At Mashatal, however, the possibility of a lighted football field and the proximity of a new school creates a potential for cross use between facilities. At al Uqair the later phase will possibly require lighted and/or secure boat slip facilities.

Access Roads/Parking Areas

Only one class of roadway was used. The typical section for roads and parking areas consists of an average base of 12 cm. and an average surface thickness of 6 cm. This section is sufficient for normal automobile traffic and is not designed to carry heavy loads. For roads, a 6 m surface width was used. For trails/walkways, the width used was 1 m, with 10 cm base and minimum surface. And, for bikeway width, 2 m was used.

Concessions

Major concessions, such as at Mashatal, the Historic Caravan Route, and al Uqair marina are considered to be costs borne by the concessioner.

An additional cost of 15% of the total has been added to cover A&E expenses for detailed design and development plans.

A 15% contingency cost to cover unforeseen events, problems, and time lapses, resulting in increased costs, also has been added.

Mashatal al Shapane Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Utilities				
1.	Water storage tank	$150 m^3$	1	195,00/ea	195,000
2.	Water lines and fittings	50mm	1080m	65/m	70,200
3.	Rest room facility	--	14	90,000/ea	1,260,000
4.	Rest room facility w/showers	--	2	160,000/ea	320,000
5.	Sanitary septic tank	$12 m^3$	10	15,000/ea	150,000
6.	Sanitary sewer lines	200mm	300m	375/m	112,500
7.	Sanitary drain tile	200mm	1200m	375/m	450,000
	Paving				
8.	Roads and parking	(4800 m.long x 6 m. wide)		$40/m^2$	1,152,000
	Picnicking and camping				
9.	Picnic/Kaabsa site	--	12	12,000/ea	144,000
10.	Picnic shelter refurbishment	--	3	30,000	90,000
	Landscaping and miscellaneous				
11.	Shrubs	--	500	160/ea	80,000
12.	Trees	--	1000	500/ea	500,000
13.	Specimen trees	--	15	12,000/ea	180,000
14.	Play equipment	--	2	80,000/ea	160,000
15.	Pool refurbishment	--	3	50,000/ea	150,000
16.	Screen fence for women's pool	--	1	15,000	15,000
17.	Soccer field surface	--	--	15,000	15,000
18.	Soccer field lighting	--	--	--	510,000
19.	Drip and spray irrigation	--	--	360,000	360,000
20.	Street barricades	100mm x 1m	25	120/m	3,000
21.	Demolition of existing entrance	--	--	75,000	75,000
22.	Trash receptacles	--	50	750/ea	37,500
23.	Signs--information and direction	--	10	500/ea	5,000
	Residence				
24.	Manager's residence	2 bedroom	1	527,000	527,000
	Interpretation				
25.	Park orientation map	--	1	12,700	12,700
	Total				6,537,900

Jawatha Mosque Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Utility				
1.	Water storage tank	$40m^3$	1	50,000/ea	50,000
2.	Water lines and fittings	50mm	190m	65/m	12,350
3.	Rest room facility	--	4	90,000/ea	360,000
4.	Sanitary septic tank	$12m^3$	2	15,000/ea	30,000
5.	Sanitary sewer lines	200mm	40m	375/m	15,000
6.	Sanitary drain tile	200mm	200m	375/m	75,000
7.	Irrigation system	--	--	--	60,000
8.	Water lines replaced	--	30m	65/m	1,950
	Paving				
9.	Roads and parking	$1600m^2$	--	$40/m^2$	64,000
	Picnicking and camping				
10.	Picnic/Kaabsa site	--	8	12,000/ea	96,000
	Landscaping and Miscellaneous				
11.	Children's play equipment	--	1	80,000/ea	80,000
12.	Recirculating fountain/spray pool	--	1	60,000/ea	60,000
13.	Landscaping				
	Shrubs	--	150	160/ea	24,000
	Trees	--	100	500/ea	50,000
14.	Benches	--	10	600/ea	6,000
15.	Repair of walls enclosing mosque	--	--	--	200,000
16.	Trash receptacles	--	20	750/ea	15,000
	Interpretation				
17.	Park orientation map	--	1	12,700/ea	12,700
18.	Interpretive signs	--	3	12,700/ea	38,100
	Total				1,250,100

Sand Stabilization Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Intensive Use Zone				
1.	Water storage tank	40m^3	4	50,000/ea	200,000
2.	Water storage tank	150m^3	1	200,000/ea	200,000
3.	Water lines and fittings	50mm	300m	65/m	19,500
4.	Rest room facility	--	6	90,000/ea	540,000
5.	Sanitary septic tank	30m^3	2	40,000/ea	80,000
6.	Sanitary septic tank	12m^3	3	15,000/ea	45,000
7.	Sanitary sewer lines	200mm	200m	375/m	75,000
8.	Sanitary drain tile	200mm	500mm	375/m	187,500
9.	Access roads	--	25,000m^2	40/m^2	1,000,000
10.	Parking areas	--	3,000m^2	40/m^2	120,000
11.	Swimming pools	--	--	--	840,350
12.	Wading pools	--	--	--	180,500
13.	Pool privacy wall	2.5-3.0m	500m	800/m	400,000
14.	Children's play equipment	--	2	80,000/ea	160,000
15.	Park maintenance area	--	--	--	650,000
16.	Visitor center/park headquarters complex	--	--	--	2,720,000
17.	Landscaping and miscellaneous	--	--	--	240,000
18.	Hiking/biking trails	5km x 2m	10,000m^2	30/m^2	300,000
	Subtotal				7,957,850
	Camping Zone				
19.	Water storage tank	40m^3	3	50,000/ea	150,000
20.	Water lines and fittings	50mm	150m	65/m	9,750
21.	Rest room facility (with shower)	--	4	160,000	540,000
22.	Rest room facility	--	2	90,000	180,000
23.	Sanitary septic tank	12m^3	3	15,000	45,000
24.	Sanitary sewer lines	200mm	100m	375/m	37,500
25.	Sanitary drain tile	200mm	300m	375/m	112,500
26.	Access roads	--	15,000m^2	40/m^2	600,000
27.	Parking areas	--	2,000m^2	40/m^2	80,000
28.	Campsites	--	25	12,000/ea	300,000
29.	Hiking/nature trails	5km x 1m	5,000m^2	30/m^2	150,000
30.	Park attendant's residence	2 bedroom	1	527,000	527,000
	Subtotals				2,731,750

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Picnicking Zone				
31.	Water storage tank	$40m^3$	3	50,000/ea	150,000
32.	Water lines and fittings	50mm	150m	65/m	9,750
33.	Rest room facilities	--	6	90,000/ea	540,000
34.	Sanitary septic tank	$12m^3$	3	15,000/ea	45,000
35.	Sanitary sewer line	200mm	150m	375/m	56,250
36.	Sanitary drain tile	200mm	300m	375/m	112,500
37.	Access road and parking	--	$2,500m^2$	$40/m^2$	100,000
38.	Picnic/kaabsa sites	--	6	12,000/ea	72,000
39.	Park attendant's residence	2 bedroom	1	527,000/ea	527,000
	Subtotal				1,612,500
	Park Residence Area				
40.	Manager's residence	4 bedroom	1	698,750/ea	698,750
41.	Guest quarters	4 bedroom	1	698,750/ea	698,750
	Subtotal				1,397,500
	Intepretation				
42.	Visitor Center				
	Audiovisual programs-planning, production and equipment	--	--	--	391,000
	Exhibits-planning, production and equipment	--	--	--	1,640,000
	Wayside exhibits-planning, production and equipment	--	--	--	96,000
43.	Visitor use areas				
	Wayside exhibits-planning, production and equipment	--	--	--	416,000
44.	General Items				2,543,000
	Directional/informational signs	--	20	500/ea	10,000
45.	Trash Receptacles	--	75	750/ea	56,250
	Total				16,308,850

North Evaporation Sea Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Visitor Center Area				
1.	Visitor center structure	--	1	--	2,281,000
2.	Exhibits-planning, production and equipment	--	--	--	4,957,200
3.	Audiovisual displays-planning, production and equipment	--	--	--	783,700
4.	Wayside exhibits-planning, production and equipment	--	--	--	76,000
5.	Water storage tank	150m^3	1	195,000/ea	195,000
6.	Water lines and fittings	50mm	50m	65/m	3,250
7.	Sanitary septic tank	30m^3	1	40,000/ea	40,000
8.	Sanitary sewer lines	200mm	50m	375/m	18,750
9.	Sanitary drain tile	200mm	100m	375/m	37,500
10.	Electrical conduit	--	250m	80/m	20,000
11.	Access road and parking	--	12,000m^2	40/m^2	480,000
12.	Benches (wood)	--	5	600/ea	3,000
13.	Hiking and nature trails	2km x 1m	2,000m^2	30/m^2	60,000
14.	Flagpoles	--	2	5,500/ea	11,000
15.	Landscaping and Miscellaneous				
	shrubs	--	150	160/ea	24,000
	trees (specimen)	--	10	12,000/ea	120,000
	trees (nursery)		40	500/ea	20,000
	Subtotal				9,130,400
	Big Lake				
16.	Water storage tank	100m^3	2	125,000/ea	250,000
17.	Water lines and fittings	50mm	2,000m	65/m	130,000
18.	Rest room facility (with showers)	--	6	160,000/ea	960,000
19.	Rest room facility	--	4	90,000/ea	360,000
20.	Sanitary septic tank	12m^3	6	15,000/ea	90,000
21.	Sanitary sewer lines	200mm	300	375/m	112,500
22.	Sanitary drain tile	200mm	600	375/m	225,000
23.	Camping/kaabsa sites	--	50	12,000/ea	600,000
24.	Access roads and parking	9km x 6m	54,000/m^2	40/m	2,160,000

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
25.	Picnic pavilion	--	1	50,000/ea	50,000
26.	Boardwalk	--	500m	1,000/m	500,000
27.	Park attendant's residence	--	--	--	527,000
	Subtotal				5,964,500
	Little Lake				
28.	Water storage tank	$100m^3$	1	125,000/ea	125,000
29.	Water lines and fittings	50mm	2,000m	65/m	130,000
30.	Rest room facility (with showers)	--	2	160,000/ea	320,000
31.	Rest room facility	--	4	90,000/ea	360,000
32.	Shower/dressing facility	--	2	50,000/ea	100,000
33.	Sanitary septic tank	$12m^3$	4	50,000/ea	60,000
34.	Sanitary sewer line	200mm	200m	375/m	75,000
35.	Sanitary drain tile	200mm	400m	375/m	150,000
36.	Access roads and parking	3km x 6m	$18,000m^2$	$40/m^2$	720,000
37.	Camping/kaabsa sites	--	40	12,000/ea	480,000
38.	Boardwalk	--	100m	1,000/m	100,000
39.	Boat pier	--	20m	1,000/m	20,000
40.	Benches (wood)	--	10	600/ea	6,000
41.	Grading and shaping (for swimming area)	--	$20,000m^2$	$15/m^2$	300,000
42.	District maintenance facility	--	--	--	200,000
43.	Park attendant's residence	2 bedroom	1	527,000	527,000
	Subtotal				3,673,000
	Interpretation (Big Lake and Little Lake)				
44.	Wayside exhibits-planning, production and equipment	--	20	--	185,400
	General Items				
45.	Directional/Information signs	--	10	1,000/ea	10,000
46.	Trash receptacles	--	60	750/ea	45,000
	Total				19,008,300

Al Uqair Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Swimming Beach				
1.	Water storage tank	$40m^3$	3	50,000/ea	150,000
2.	Water lines and fittings	50mm	1000m	65/m	65,000
3.	Rest room facility (w/showers)	--	10	160,000/ea	1,600,000
4.	Rest room facility	--	10	90,000/ea	900,000
5.	Sanitary septic tank	$12m^3$	10	15,000/ea	150,000
6.	Sanitary sewer lines	200mm	300m	375/m	112,500
7.	Sanitary drain tile	200mm	1000m	375/m	375,000
8.	Access road, surface only	4km x 6m	$24,000m^2$	$25/m^2$	600,000
9.	Access road, surface and base	4km x 6m	$24,000m^2$	$40/m^2$	960,000
10.	Parking		$8,400m^2$	$40/m^2$	336,000
11.	Sand fill, beach and swimming area	--	$100,000m^2$	$15/m^2$	1,500,000
12.	Floating swimming/fishing Pier	2m(W) x 200m(L)	2	$2,750/m^2$	1,100,000
13.	Landscaping and miscellaneous	--	--	--	48,000
14.	Signs, information and direction	--	10	500/ea	5,000
15.	Trash receptacles	--	50	750/ea	37,500
					7,939,000
	Camping Zone				
16.	Water storage tank	$40m^3$	1	50,000	50,000
17.	Water lines and fittings	50mm	700m	65/ea	13,000
18.	Rest room facility	--	4	90,000	360,000
19.	Sanitary septic tank	$12m^3$	2	15,000/ea	30,000
20.	Sanitary sewer line	200mm	80	375/m	30,000
21.	Sanitary drain tile	200mm	200	375/m	75,000
22.	Trash receptacles	--	20	750/ea	15,000
23.	Parking	--	$600m^2$	$40/m^2$	24,000
24.	Camp sites	--	20	12,000/ea	240,000
25.	Signs, information and direction		5	500/ea	2,500
					839,500
	Undeveloped Beach Zone				
26.	Water storage tank	$40m^3$	1	50,000/ea	50,000
27.	Water lines and fittings	50mm	200m	65/m	13,000
28.	Rest room facility (w/showers)	--	4	160,000/ea	640,000
29.	Sanitary septic tank	$12m^3$	2	15,000/ea	30,000
30.	Sanitary sewer lines	200mm	60m	375/m	22,500
31.	Sanitary drain tile	200mm	200m	375/m	75,000
32.	Trash receptacles	--	10	750/ea	7,500
33.	Signs, information and direction	--	5	500/ea	2,500
					840,000
	Marina Zone				
34.	Water storage tank	$100m^3$	1	125,000/ea	125,000
35.	Water lines and fittings	50mm	200m	65/ea	13,000
36.	Rest room facility	--	4	90,000	360,000
37.	Sanitary septic tank	$12m^3$	2	15,000/ea	30,000
38.	Sanitary sewer line	200mm	100m	375/m	37,500
39.	Sanitary drain tile	200mm	200	375/m	75,000
40.	Floating pier and boat slips (w/water line and lighting)		$3,180m^2$	$2,750/m^2$	8,745,000
41.	Dredging		$20,000m^3$	$25/m^3$	500,000
42.	Breakwater	300m x 2m x 2m			1,120,000
43.	Parking		$5,400m^2$	$40/m^2$	216,000
44.	Concrete boat ramp	10m x 50m x .2m	$100m^3$	$1,200/m^3$	120,000
45.	Benches		20	600/ea	12,000
46.	Trash receptacles		20	750/ea	15,000
47.	Signs, information and direction		5	500/ea	2,500
48.	Navigation aids (buoy with chain & anchor)	--	15	2,800/ea	42,000
					11,413,000

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Fort/Customs House area				
49.	Stabilize fort complex*				
50.	Renovate customs house*				
51.	Water storage tank	$100m^3$	1	125,000/ea	125,000
52.	Water lines and fittings	50mm	500m	65/m	32,500
53.	Sanitary septic tank	$30m^3$	1	40,000/ea	40,000
54.	Sanitary sewer lines	200mm	100m	375/m	37,500
55.	Sanitary drain tile	200mm	100m	375/m	37,500
56.	Patio-paved	$575m^2$ x .1m	$57.5m^3$	$1,100/m^3$	63,250
57.	Parking		$2,900m^2$	$40/m^2$	116,000
58.	Landscaping	--	--		
	Trees	--	180	500	90,000
	Specimen trees	--	20	12,000/ea	240,000
	Shrubs	--	100	160/ea	16,000
	Irrigation system	--	--	200,000/.s.	200,000
59.	Signs, information and direction	--	5	500/ea	2,500
60.	Benches		5	600/ea	9,000
61.	Trash receptacles	--	15	750/ea	11,250
62.	Walkways	400 x 2m	$800m^2$	$35/m^2$	28.000
63.	Park attendant's residence	2br.		527,000	527,000
64.	District maintenance facility	--	--	200,000	200,000
					1,775,500
	Interpretation				
65.	Park orientation map panel	--	2	12,700	25,400
66.	Large wayside interpretive panels	--	10	12,700	127,000
	Total				22,959,900

* No estimates given for these. Lack of detailed knowledge of structural integrity of these two old structures precludes ability to provide reasonable estimate.

Q'asr Kilabiyah Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Utility				
1.	Water storage tank	$40m^3$	1	50,000/ea	50,000
2.	Water lines and fittings	50mm	100m	65/m	6,500
3.	Rest room facility	--	2	90,000/ea	180,000
4.	Sanitary septic tank	$12m^3$	1	15,000/ea	15,000
5.	Sanitary sewer lines	200mm	30m	375/m	11,250
6.	Sanitary drain tile	200mm	100m	375/m	37,500
7.	Irrigation system	--	--	--	75,000
	Paving				
8.	Access road	400m x 6m	$2400m^2$	$40/m^2$	96,000
9.	Parking	--	$800m^2$	$40/m^2$	32,000
	Landscaping and Miscellaneous				
10.	Fort stabilization	--	--	--	100,000
11.	Walls and steps	--	100m	750/m	75,000
12.	Specimen trees	--	10	12,000/ea	120,000
13.	Trees	--	50	750/ea	37,500
14.	Benches, wood	--	10	600/ea	6,000
	Interpretation				
15.	Park orientation map panel	--	1	12,700/ea	12,700
16.	Large wayside exhibit panel	--	2	12,700/ea	25,400
	Total				879,850

Jebel al Q'arah Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
1.	Shade structure for playground		1	--	170,000
2.	Foot path with handrail	400m x 1 m	400m2	--	40,000
3.	Bicycle trail	1.5km x 2m	3000m2	100/m3	90,000
4.	Benches, wood	----	6	600/ea	3,600
5.	Landscaping				
	Trees	----	50	500/ea	25,000
	Shrubs	----	50	160/ea	8,000
	Interpretation				
6.	Park orientation map panel		1	12,700	12,700
7.	Large wayside exhibit panel		2	12,700	25,400
8.	Small wayside exhibit panel		4	5,900	23,600
	Total				398,300

Jebel Arba' Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Utilities				
1.	Water storage tank	$40m^3$	1	50,000/ea	50,000
2.	Water lines and fittings	50mm	150m	65/m	9,750
3.	Rest room facility	--	2	90,000/ea	180,000
4.	Sanitary septic tank	$6m^3$	1	10,000/ea	10,000
5.	Sanitary sewer lines	200mm	30m	375/m	11,250
6.	Sanitary drain file	200mm	100m	375/m	37,500
	Paving				
7.	Access road	1km x 6m	6000m2	40/m	240,000
	Parking	25m x 50m	1250m2	40/m	50,000
	Landscaping and miscellaneous				
8.	Trees	--	20	500/ea	10,000
9.	Trails	1000m x 1m	1000m2	30/m2	30,000
10.	Benches		10	600/ea	6,000
11.	Signs--information and direction	--	4	500/ea	2,000
	Interpretation				
12.	Park orientation map	--	1	12,700/ea	12,700
13.	Large wayside exhibit panel		1	12,700/ea	12,700
	Total				661,900

Q'asr Waziyah Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
	Utility				
1.	Water storage tank	$40m^3$	1	50,000/ea	50,000
2.	Water lines and fittings	50mm	100m	65/m	6,500
3.	Rest room facility	--	2	90,000/ea	180,000
4.	Sanitary septic tank	$12m^3$	1	15,000/ea	15,000
5.	Sanitary sewer lines	200mm	30m	375/m	11,250
6.	Sanitary drain tile	200mm	100m	375/m	37,500
	Landscaping and Miscellaneous				
7.	Trees	--	10	500/ea	5,000
8.	Shrubs	--	50	160/ea	8,000
	Interpretation				
9.	Park orientation map panel	--	1	12,700/ea	12,700
10.	Large wayside exhibit panel	--	1	12,700/ea	12,700
	Total				338,650

Al Hassa Hiking / Biking Trail Cost Estimate

Item No.	Item Description	Size	Quantity	Unit Cost (SR)	Cost (SR)
1.	Hiking/biking trail, paved	50kmx2m	100,000m^2	40/m^2	4,000,000
	Interpretation				
2.	Large wayside interpretive panel		3	12,700	38,100
3.	Small wayside interpretive panel		10	5,900	59,000
	Total				4,097,100

Q'asr Ibrahim Cost Estimate

1.	Park orientation map panel		1	12,700	12,700
2.	Large wayside interpretive panel		1	12,700	12,700
	Total				25,400

Historic Caravan Route Cost Estimate

1.	Large wayside interpretive panel		2	12,700	25,400

Roadside Rest Cost Estimate

1.	Large wayside intepretive panel		10	12,700	127,000

Hofuf CLIMATOLOGICAL DATA SUMMARY PERIOD 1966-1975

(N 25° 30' E 49° 34') ATMOSPHERIC TEMPERATURE, °C & (°F)

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	YEARS OF RECORD
ABSOLUTE MAXIMUM	29(84)	35(95)	37(99)	44(111)	46(115)	48(118)	48(118)	49(120)	47(117)	43(109)	40(104)	29(84)	10
AVERAGE DAILY MAXIMUM	19(66)	22(72)	27(81)	33(91)	37(99)	42(108)	43(109)	44(111)	41(106)	38(100)	32(90)	20(68)	10
ABSOLUTE MINIMUM	0(32)	2(36)	4(39)	11(52)	16(61)	18(64)	20(68)	17(63)	16(61)	11(52)	7(45)	1(34)	10
AVERAGE DAILY MINIMUM	6(43)	8(46)	14(57)	18(65)	21(70)	22(72)	23(73)	22(72)	21(70)	17(63)	12(54)	9(48)	10
DAILY MEAN	14(57)	17(63)	20(68)	25(77)	30(86)	33(91)	34(93)	35(95)	34(93)	29(84)	24(75)	18(64)	
AVERAGE RELATIVE HUMIDITY	26	60	56	55	48	34	32	29	30	35	42	55	10
RAINFALL, mm & (inches)	10(.39)	2(.08)	19(.75)	25(.8)	1(0+)	0.0	0.0	0.0	0.0	0.0	.3(.12)	6(.24)	10
WIND SPEED, km hr & (knots)													Annual Avg.
2 meter level													60(2.36)
MAXIMUM	22(12)	27(14)	29(16)	26(14)	24(12)	26(14)	24(12)	25(13)	27(14)	19(10)	25(13)	18(10)	10
AVERAGE DAILY MAXIMUM	11(6)	11(6)	13(7)	11(6)	11(6)	13(7)	9(5)	9(5)	9(5)	7(3)	9(5)	10(5)	10
DAILY MEAN	15(8)	15(8)	16(9)	14(8)	14(8)	16(9)	15(8)	13(7)	12(6)	10(5)	14(8)	14(8)	10
10 meter level													
MAXIMUM	47(29)	51(31)	57(35)	55(34)	51(31)	57(35)	54(33)	48(29)	48(29)	46(28)	48(29)	49(30)	10
AVERAGE DAILY MAXIMUM	19(12)	20(12)	23(14)	21(13)	20(12)	24(15)	24(15)	18(11)	16(10)	29(17)	22(13)	30(18)	10
DAILY MEAN	19(10)	19(10)	21(11)	17(10)	20(10)	21(11)	24(12)	15(8)	17(9)	11(6)	19(10)	16(9)	10
WIND DIRECTION (predominant)	NNW	N	N	NE	N	N	NW	N	N	N	N	NNE	10

FROM: Arabian American Oil Company. 1978. Meteorologic and Oceanographic Data Book. Dhahran. p. 23.

The Fauna of al Hassa

A. Preliminary List of Birds

Red-billed tropicbird *(Phaethon aethereus)*
Little bittern *(Ixobrychus minutus)*
Little green heron *(Butorides striatus)*
Reef heron *(Egretta gularis)*
Greater flamingo *(Phoenicopterus ruber)*
Ruddy shelduck *(Tadorna ferruginea)*

Long-legged buzzard *(Buteo rufinus)*
Egyptian vulture *(Neophron percnopterus)*
Griffon vulture *(Gyps fulvus)*
Barbary falcon *(Falco pelegrinoides)*
Sooty falcon *(Falco concolor)*
strel *(Falco tinnunculus)*
Lanner *(Falco biarmicus)*

Little grebe *(Tachybaptus ruficollis)*
Desert partridge *(Ammoperdix heyi)*
Grey francolin *(Francolinus pondicerianus)*
Water rail *(Rallus aquaticus)*
Moorhen *(Gallinula chloropus)*
Coot *(Fulica atra)*

Avocet *(Recurvirostra avosetta)*
Cream-coloured courser *(Cursories cursor)*
Crab plover *(Dromas ardeola)*
Black-winged stilt *(Himantopus himantopus)*
Little ringed plover *(Charadrius dubius)*
Kentish plover *(Charadrius alexandrinus)*
Red-wattled plover *(Hoplopterus indicus)*

Sooty gull *(Larus hemprichii)*
Slender-billed gull *(Larus genei)*
Gull-billed tern *(Gelochelidon nilotica)*
Caspian tern *(Sterna caspia)*
Saunders' tern *(Sterna saundersi)*

White-cheeked tern *(Sterna repressa)*
Lesser crested tern *(Sterna bengalensis)*
Swift tern *(Sterna bergii)*
Bridled tern *(Sterna anaethetus)*

Lichtenstein's sandgrouse *(Pterocles Lichtensteinii)*
Coronetted sandgrouse *(Pterocles coronatus)*
Spotted sandgrouse *(Pterocles senegallus)*
Chestnut-bellied sandgrouse *(Pterocles exutus)*
Pin-tailed sandgrouse *(Pterocles alchata)*

Rock pigeon *(Columbia livia)*
Collared dove *(Streptopelia decaocto)*
Turtle dove *(Streptopelia turtur)*
Palm dove *(Streptopelia senegalensis)*
Namaqua dove *(Oena capensis)*
Indian roller *(Coracias benghalensis)*
Ring-necked parakeet *(Psittacula krameri)*

Barn owl *(Tyto alba)*
Little owl *(Athene noctua)*
Striated scops owl *(Otus brucei)*
Eagle owl *(Bubo bubo)*
Osprey *(Pandion haliaetus)*
Hoopoe *(Upupa epops)*
Little green bee-eater *(Merops orientalis)*
White-collared kingfisher *(Halcyon chloris)*

Dunn's lark *(Eremalauda dunni)*
Black-crowned finch lark *(Eremopterix nigriceps)*
Desert lark *(Ammomanes deserti)*
Bifasciated lark *(Alaemon alaudipes)*
Lesser short-toed lark *(Calandrella rufescens)*
Crested lark *(Galerida Cristata)*

Bimaculated lark *(Melanocorypha bimaculata)*
Temminck's horned lark *(Eremophila bilopha)*
Great grey shrike *(Lanius excubitor)*
Long-billed pipit *(Anthus similis)*
White-eared bulbul *(Pycnonotus leucogenys)*
Black-capped bubul *(Pyconontus xanthopygos)*
Rufous bushchat *(Cercotrichas galactotes)*
Hume's wheatear *(Oenanthe alboniger)*

White-crowned black wheatear *(Oenanthe Leucopyga)*
Graceful warbler *(Prinia gracilis)*
Moustached warbler *(Acrocephalus melanopogon)*
Olivaceous warbler *(Hippolais pallida)*
Scrub warbler *(Scotocerca inquieta)*
Arabian babbler *(Turdoides squamiceps)*
Purple sunbird *(nectarinia asiatica)*

House sparrow *(Passer domesticus)*
Yellow-throated sparrow *(Petronia xanthocollis)*
Indian silverbill *(Euodice malabarica)*
Common mynah *(Acridotheres tristis)*
Bank mynah *(Acridotheres ginginianus)*
Trumpeter finch *(Bucanetes githagineus)*
House bunting *(Emberiza striolata)*

B. Preliminary List of Mammals

Shrews *(Fam. Soricidae)*
Indian house shrew *(Suncus murinus)*

Hedgehogs *(Fam. Erinaceidae)*
Long-earned hedgehog *(Hemiechinus auritus)*
Ethiopian hedgehog *(Paraechinus aethiopicus)*
Brandt's hedgehog *(Paraechinus hypomelas)*

Bats *(Order Chiroptera)*

Fruit-eating bats *(Fam. Pteropodidae)*
Egyptian fruit bat *(Rousettus aegyptiacus)*

Mouse-tailed bats *(Fam. Rhinopomatidae)*
Muscat mouse-tailed bat *(Rhinopoma muscatellum)*
Lesser mouse-tailed bat *(Rhinopoma hardwickei)*

Sheath-tailed bats *(Fam. Emballonuridae)*
Naked-bellied tomb bat *(Taphozous nudiventris)*

Horseshoe bats *(Fam. Rhinolophidea)*
Arabian horsehoe bat *(Rhinolophus clivosus)*

Leaf-nosed bats *(Fam. Hipposideridae)*
Trident leaf-nosed bat *(Asellia tridens)*
Persian leaf-nosed bat *(Triaenops persicus)*

Vespertilionid bats *(Fam. Vespertilionidae)*
Kuhl's pipistrelle *(Pipistrellus kuhli)*
Hemprich's long-eared bat *(Otonycteris hemprichi)*

Carnivores *(Order Carnivora)*

Mustelids *(Fam. Mustelidae)*
Honey badger *(Mellivora capensis)*

Dogs, jackals, wolves, foxes *(Fam. Cenidae)*
Wolf *(Canis lupus)*
Asiatic jackal *(Canis aureus)*
Common red fox *(Vulpes vulpes)*
Ruppell's sand fox *(Vulpes ruppelli)*
Fennec fox *(Fennecus zerda)*

Mongooses, genets *(Fam. Viverridae)*
Indian grey mongoose *(Herpestes edwardsi)*

Hyaenas *(Fam. Hyaenidae)*
Striped hyaena *(Hyaena hyaena)*

Cats *(Fam. Felidae)*
Wild cat *(Felis silvestris)*
Sand cat *(Felis margarita)*
Caracal lynx *(Caracal caracal)*
Leopard *(Panthera pardus)*
Cheetah *(Acinonyx jubatus)*

Even-toed Ungulates *(Order Artiodactyla)*

Cattle, goats, sheep, antelopes *(Fam. Bovidae)*
Wild goat *(Capra aegagrus)*
Arbian tahr *(Hemitragus jayakari)*
Arabian oryx *(Oryx leucoryx)*
Goitred gazelle; Rhim *(Gazella subgutturosa)*
Dorcas gazelle; Afri *(Gazella dorcas)*
Mountain gazelle; Idmi *(Gazella gazella)*

Lagomorphs *(Order Lagomorpha)*
Cape hare *(Lepus capensis)*

Rodents *(Order Rodentia)*

Porcupines *(Fam. Hystricidae)*
Indian crested porcupine *(Hystrix indica)*

Jerboas, birch mice *(Fam. Dipodidae)*
Euphrates jerboa *(Allactaga euphratica)*
Lesser jerboa *(Jaculus jaculus)*

Rats, mice *(Fam. Muridae)*
Golden spiny mouse *(Acomys russatus)*
Spiny mouse *(Acomys dimidiatus)*
Short-tailed bandicoot rat *(Nesokia indica)*
Brown rat: Norway rat *(Rattus norvegicus)*
House rat; Black rat *(Rattus rattus)*
House mouse *(Mus musculus)*

Hamsters, gerbils, voles *(Fam Cricetidae)*
Bushy-tailed jird *(Sekeetamys calurus)*
Indian gerbil; Antelope rat *(Tatera indica)*
Sundevall's jird *(Meriones crassus)*
Libyan jird *(Meriones libycus)*
Fat jird *(Psammomys obesus)*

Cheesman's gerbil *(Gerbillus chessmani)*
Baluchistan gerbil *(Gerbillus nanus)*
Wagner's gerbil *(Gerbillus dasyurus)*

Trees and Plants Used in the Sand Stabilization Project

Bluefeal Acacia (*Acacia cyanophylla*)
Aloe (*Agave Spp.*)
Silk Tree, Lebbek Albizzia (*Albizzia lebbek*)
Jericho Ressurectionplant (*Anastatica hierochuntica*)
Cunningham Beefwood (*Casuarina cunninghamiana*)
Sheepweed (*Dodonaea viscosa* (*Suaeda*)
Longbeak Eucalyptus (*Eucalyptus camaldulensis*)
Common Lantana (*Lantana camara*)
White Mulberry (*Morus alba*)
Red Mulberry (*Morus rubra*)
Common Oleander (*Nerium oleander*)
Jerusalemthorn (*Parkinsonia aculeata*)
Flamboyanttree (*Poinciana regia*)
Honey Mesquite (*Prosopis Juliflora*)
Castor Bean (*Ricinus communis*)
Athel Tamarisk (*Tamarix aphylla*)
Tamarix (*Tamarix articulata*)
French Tamarix (*Tamarix gallica*)
Yellow Trumpet (*Tecoma stans*)
California Fan Palm (*Washingtonia filifera*)
Jujube (*Zizyphus spina-christi*)

Al Hassa Oases Population Centers

Cities

Hofuf (al Hufuf)
al-Mubarraz
al-Uyun

Villages

Abu al-Hasa
Abu al-Thawr
Abu al-'Unuz
al-Aramiyah
al-'Aqar
al-Asalah
Bani 'Awad
Bani Ma'n
al-Battaliyah
al-Dalwah
al-Dirisiyah
al-Duwaykiyah
al-Fadiliyah
Fariq al-Gharas
Farig al-Raml
Farig al-Sadawiyah
Farig ash-Shimali
al-Fudul
Ghuuasi
al-Hawtah
al-Hulaylah
al-Hurayr
al-Husaymah
al-'Idwah
al-Jafr
al-Jishshah
al-Jubayl
al-Julayjilah
al-Kilabiyah
al-Malihah
al-Mansurah
al-Marah
al-Markaz
al-Mazawi
al-Migdam
al-Muhtaragah
al-Munayzilah
al-Mutayrifi
al-Q'arah
al-Qarn
al-Qurayn
al-Rumaylah
al-Sabat
al-Salihiyah
ash-Shaharin
ash-Shu'bah
ash-Shugayg
al-Shuwaykiyah
al-Subayyikh
al-Suwaydi
al-Suyayyirah
al Taraf
al Tuhamiyah
al Turaybil
al Tuwaythir
al-'Umran-Janubiyah
al-'Umran-Shinaliyah
al-Ulayyah
Wasit
Al Waziyah
Zugaygan

School Age Population*

Al Hassa (Hofuf) School System
1401-1402 A.H. / 1981-1982 C.E.

Category	Ages	# of Schools	# of Students
Pre-School	4-6		255
Primary	6-11	126	30,911
Intermediate	12-14	41	7,226
Secondary	15-18	10	2,291
Private (Special Education)		4	21
Total			40,704

* Data supplied by Mr. Abdulwhab Al-Mahawesh, Director, Al Ahsa School System, Ministry of Education, Kingdom of Saudi Arabia, May 29, 1982.

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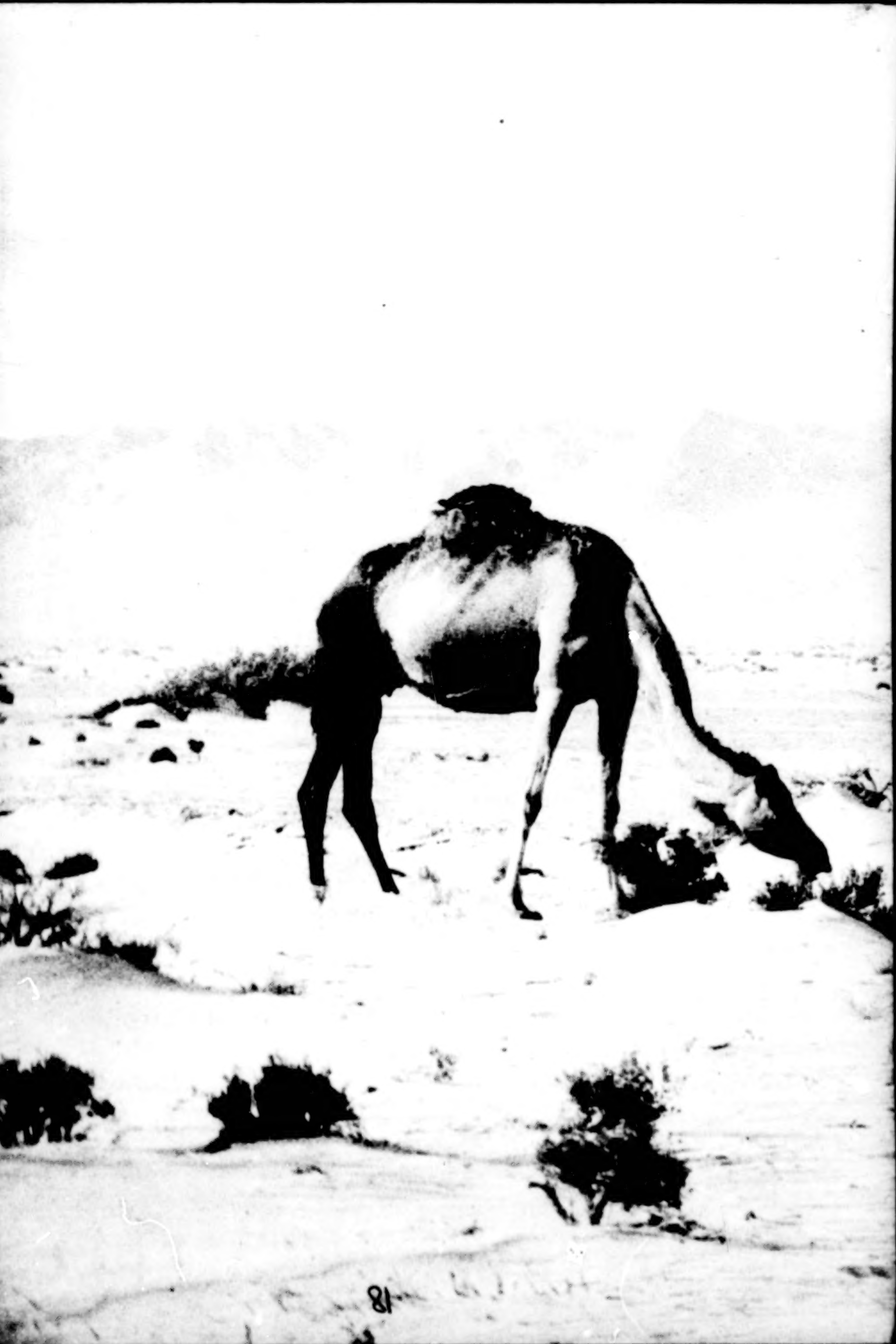
Planning Team

Al Hassa/Uqair National Recreation Park
Eastern Province, Kingdom of Saudi Arabia
May-July 1982

U.S. NATIONAL PARK SERVICE
Ronald W. Cooksy, *Team Leader*
Bill Clark, *Interpretive Planner*
John Haubert, *Recreation Planner*
Marc A. Koenings, *Recreation Planner*
David McLean, *Exhibit Designer*
James F. Orr, *Plan Coordinator*
Doug Phillips, *Engineer*
John J. Reynolds, *Landscape Architect*
Marc Sagan, *Interpretive Planner*
Terry W. Savage, *Landscape Architect*
K. Chris Soller, *Recreation Planner*
Michael Summerlin, *Architect*
Ahmed Mohsen al-Hagi, *Translator/Facilitator*,
Asir National Park



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